

WAR DEPARTMENT TECHNICAL MANUAL



SHOE REPAIR MACHINES

(LANDIS AND AMERICAN)

WAR DEPARTMENT

OCTOBER 1946

TM10-262

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washington 25, D. C., 1 October 1946

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FOREWORD

The instructions in the manual are published for the information and guidance of the per-ormed to whom the hoe repair equipment is a igned. They contain information on the operation, maintenance, and repair of the titching, finishin a combination ole cutter and kfrer, and patchinu maclune, and on the hoe repair trailer itself. Each major unit of equipment is described and is function in re-lation to the other component is educated.

The manual is divided imo five book which cover the follow-ing equipment.

Book 1- TITCHENG MACHI TE (American .:'. fodeJs B. C. and CA. and Landi :No. 1Z Model F and K.

Book 2-FINT HITG MACHI -E. American Model L. and Landi_ 100 Line Model 102).

Book 3- OLE CUTTER AND KIVER MACHIKE / American Model B, and Landi).

 $\it Book$ 4--PATCHE "G IACHLIB = m er Models 29K5 , 29K60, 29K62, and 29K70).

Book 5-TRAJLER, T'.YO-"-HEEL. HOE REPAIR.

The in truction in each of the Eve book_ are arranged in fore pan- as fellfJW.5: Part One. Introduction.

Part Two. Operating Intruction-.

Part Three. .:'.. faintenance Instruction.

Part Four, Am.::Jiarv

Part Five, Repair In truction

uformation on the -lora c and 'rupment of the equipmen, and pertinent rence uch a applicable upply catalorr-, Technical Manual: manufacturer's nuals, and Film trip will be found in the appendices.

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BOOK I STITCHING MACHINE

Landis No. 12 models F and K

American models B, C, and CA

PART ONE INTRODUCTION

Section I. GENERAL

I. Scope

The instructions in book I apply to the Stitching Machine, Landis No. 12 Models F and K and American Models B, C, and CA. Each of the five models is a curved needle and awl sole stitcher de-signed to sew the outsole to welted soles.

- a Part two contains information on the operation of the stitching machine and a description of its controls and instruments.
- b Part three contains information for the guid- ance of the personnel of using organizations responsible for the first and second echelon maintenance of the stitching machine. It contains in formation needed for the scheduled lubrication and preventive maintenance service. Paragraphs 52 through 71 are devoted to second echelon maintenance for the vari- ous assemblies and major units which comprise the Landis No. 12 Model K Stitcher. They contain short descriptions of the components as well as explana- tions of the purpose, functioning, and interrelation- ship of systems in the equipment. These sections contain description, removal, adjustment, and in- stallation of unit. Only the maintenance which the unit mechanic of the u ing organization is authorized to perform is included.
- c Part five contains instructions for the information and guidance of personnel responsible for third and higher echelon maintenance of the stitching machine. It contains maintenance information which is beyond the scope of the tools, equipment, and supplies normally available to using organizations. Details of motor maintenance are given in TM 9-1825A.

2. Requisitioning Information

Tools, spare parts, and supplies should always be requisitioned by Federal stock number and standard nomenclature when these are indicated. If no Fed-eral stock number is shown, requisition is by vendor's part number and nomenclature. When ordering spare parts, give the serial number of the machine in addition to the vendor's part number

and nomenclature.

3. Records

- a. WD AGO FORM 460 (PREVENTIVE MAINTE-NANCE ROSTER). The parts of this form which apply to stitching machines may be maintained to record the lubrication of this equipment, as described in paragraphs 44 and 45.
- b. WD AGO FORM 468 (UNSATISFACTORY EQUIPMENT REPORT). This form will be used to report defects in the manufacturing, design, or operation of machines, assemblies, or parts. The same form will be used to report complaints on the lubri- cants and preserving materials used in the machines. When so used, the form will contain identifying details of the products and machinery on which they are used.

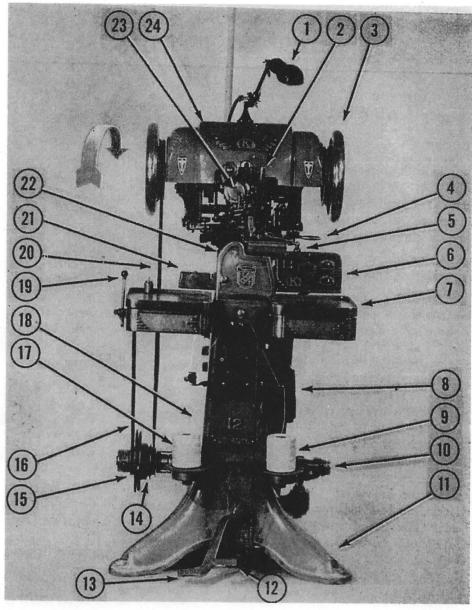
4. Orientation

- a Throughout this book the terms FRONT, REAR, LEFT and RJGHT are used as the operator standing at the controls of the stitcher in the operating position would use them.
- b The cams in the stitcher head are numbered from the left: No.. one, two, three, and four.

Section II. DESCRIPTION AND DATA

5. Description

- a GENERAL. The five models included in this book are fundamentally alike. Any one of them may be found in the van type shoe repair trailers or in fixed repair.installations. However, the Landis No. 12 model K (fig. 1) is the model most commonly used. This model is standard in filling the stitcher requirements of the Army. This machine is also in the Landis portable shoe repair unit (fig.
- 4) which is installed in the two-wheel shoe repair trailer. For that reason, the text of this book is based on the Landis No. 12 model K Stitcher. Specific reference to the maintenance and operation of the other four models of stitchers will be made only when applicable instructions differ from those prescrib d for the model K Stitcher.



Ref. No.	1Vomeac/ature	Ref.	
1 2	Lamp. Presserfoot lever.	No. Nomen.clature 13 Power treadle.	
3	Handwheel.	Power belt wheel. Power friction wheel.	
5	Feed and guide handle. Shoe guide shifter handle.	Bobbin winder belt. Bobbin thread.	
7 8	Control panel. Tool shelf. Motor control.	Stand column. Bobbin winder shifter handle.	
9 10 11	Needle thread. Power shaft. Standard base.	21 Bobbin oven. 22 Heat guard.	
12	Presserfoot treadle.	Shuttle. Cam cover.	

Figure 1. Landis Nu. 12 model K sole stitcher.

- h IDENTIFICATION. The operator should be able to identify his machine completely. The name and model letter of the American models B, C, and CA appear on the front of the stitcher head cover. The erial number of the machine is shown on the metal plate at the top of the control panel. (See fig. 3.) The name and the model number and letter of the Landis machines is found on the stitcher head cover and on the control panel. The serial number appears on the metal plate fastened on the base of the stitcher head directly beneath cam lo. two. Accurate identification of the machine is especially important in ordering replacement parts.
- c DIFFERENCES IN Models. The five models are basically alike, but they are different to the extent that the models developed most recently contain ome improvements not found on the others.
 - (I) Landis model F. This model (fig. 2) was

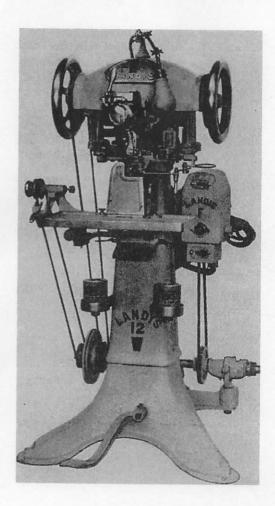


Figure 2. Landis No. 12 model F sole stitcher.

- the first of the two Landis models to be used by the Army. The presserfoot lift is hand-operated and the presserfoot has a ratchet lock. It has no manual release on the thread lock. The first model F stitchers have a rheostat temperature control for the use of ha.rd wax, but later models of this stitcher have the same thermostatic heat control as that used on the Landis model K.
- (2) Landis m del K On the model K (fig. 1) the presserfoot can be released and raised with a footoperated contJ-ol This operation simultaneously releases the thread lock. The lock on the presserfoot of the model K is a multi:thr ad screw and nut. Operating temperature of the wax- and threadhandling mechanisms is automatically controlled by a Vi/bite-Rogers hydraulic diaphragm switch thermostat. The K has a front thread lock and carriesa heavy tension. vVhen the thread must be pulled manually, both lock and tension can be released by operating the foot control. The heating elements on models K and F are alike, but are different from the heating elements on the American models. Models K and F have four flat, conduction type heat units which total 260 watts. One is clamped to the shuttle head, one to the wax pot (heat plate), one to the takeup (heat plate), and one to the bobbin winder.
- (3) American model B. The model B (fig. 3) is one of the earlier American models. The presser-foot lift is hand operated and the presserfoot hasa ratchet lock. The thread lock does not have a manual release. Operating heat temperature is controlled by a rheostat. Later models of the modelB-stitcher have the same thermostatic heat control used on the American models C and CA. The heating elements used on this stitcher are the same as those used on models C and CA. The stitche has four heating elements, each Yi inch in diameter, supplying a total heating capacity of 300 watts. The heating units are inserted in Yi-inch holes in the machine parts that are to be heated. One is placed in the shuttle head and the other three go into the heat plate.
- (4) American 111 odels C and CA. In these models the operating heat is controlled by a Minneapolis-Honeywell mercury tube and bimetal coil thermostat. The presserfoot is released and raised with a foot-operated control. Operation of that control simultaneously releases the thread lock. The presserfoot hasa ratchet lock. The model C has a double thread lock with two thread lock rolls and a thread meas-

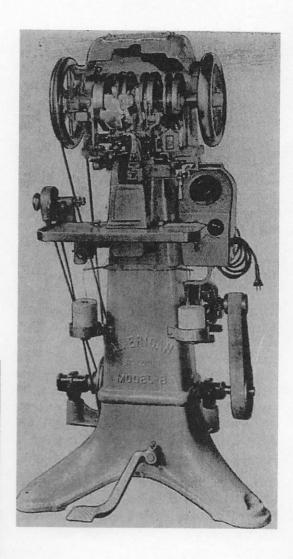


Figure 3. American model B sole stitrher. /Cam coi*er has been lifted to sl=ou operating mechallisl11 of the stitcher head.) A mencall models C and CA (not shown) are sil111-101 to this model in appearance.

urer operating between the action oi the rolls. The thread lock roll alternately open and close automatically as the thread i. mea. ured and the lock i pulled in. In the model C\, that de.ig11 ha. been changed to one thread lo,k roll and a tension lock. The ten, ion lock is <'t with a moderate ten-ion that yields readily to pulling of the thread. It is locked only \\herefore\her

6. Tabulated Data

a HTPPIKG DATA. The shipping data listed

below for the Landi models F and K are not given for the American model B, C, and CA, which are no longer in production. The specifications are for the machines when boxed.

Landis		Dimen.si01i (in.)			WeiglrJ (lbs.)	i
mod.cl	Lellgth		Height	Gross	Tare	Net
F	36	- Wwil-	64	1,050	490	560
K	36		64	1,110	510	600

- b PERFOR:\IAKCE. (1) 0 perating speed. The countershaft of these stitchers should be run at a peed of about 600 revolutions per minute. At that peed the camshaft in the head of the titcher will operate at the prescribed speed of 250 to 300 revolution per minute.
- (2) Operating capacity. If the machine is run at the prescribed speed by a skilled operator, and the \\\·elts and oles of the shoes are properly prepared for titching, the stitcher will ew 30 to 40 pairs of hoe per hour.
- c IfoTOR. (1) Sillgle-U,11it stitcher. The 0-hor epower, single-pha e, 60-cycle, 115 to 230-volt motor with thern1al overload protection is standard.
- (2) Stitcher-finisher unit. The 12K-100 special unit (fig. 4) used on the two-, heel shoe repair trailer contain a 10-horsepower. sino-le-pha e. 60- cycle, 110 to 220-volt, 1,750-reYolutions-per-minute motor with thermal overload protection.

Section III. TOOLS AND ACCESSORIES

7. Tools

- a LAKDIS MODELS F AND K. The tools for Landi models F and K are hown in figure 5.
- b. AMERICAN":\fODELS B. C, Al'i"D CA. The tools for American models B, C, and CA are shown in figure 6.

8. Supplies

a LA mrs MODELS F AND K. The supplie for Landi model F and K are h ted on page 7.

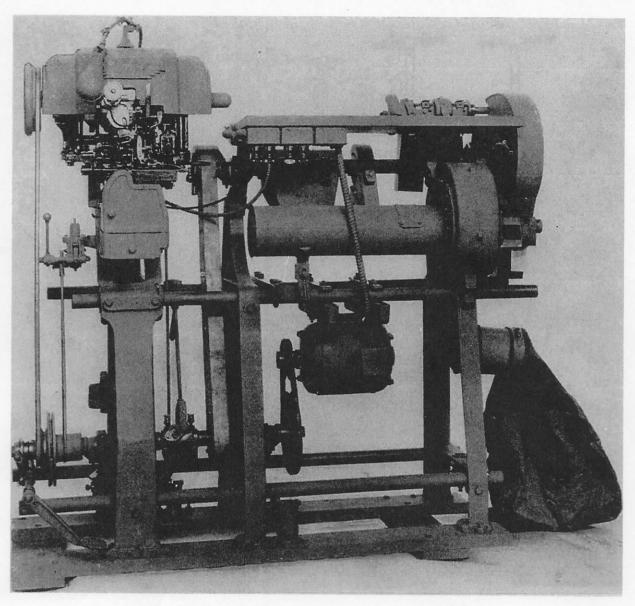


Figure 4. Landis portable shoe r,epair ul lit model 12 K-100 special. (Landis No. 12 model K stitcher appears at the left of the unit.)

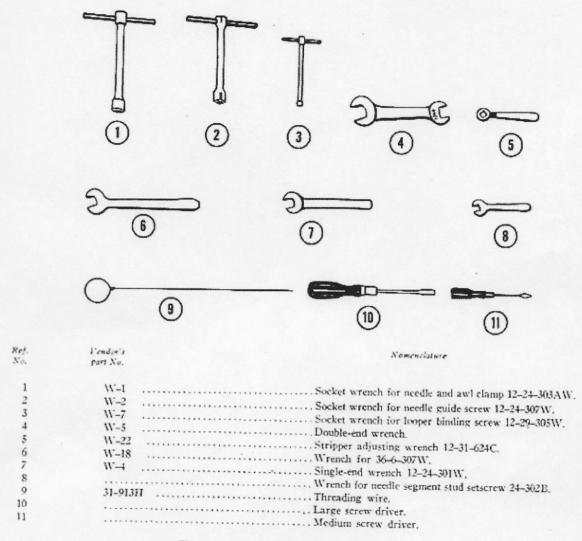
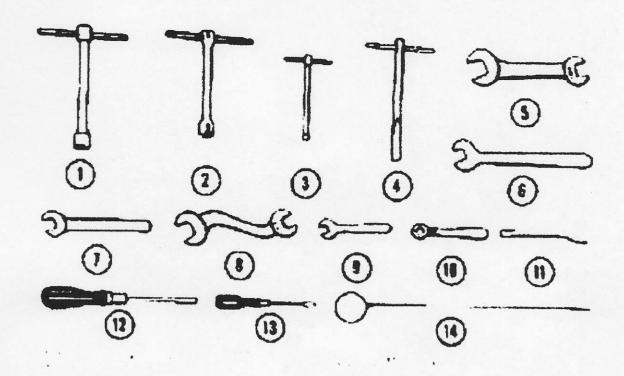


Figure 5. Tools jurnished with Landis models F and K.



Ref. No.	Vendor's Nonienclatitre part No.
1 2 3 4 6 7 8 9 10 11 12 13	B-14-1

Cubbla	13.4

Vendor' part No.	Name	No. fitrnishee
	No. 22 needles	12
	No. 22 awls	12
	No. 23 awls	12
K2S-6	B'obbins	2
24-308	Needle plate screw	1
24-307	Needle guide screws	2
31-908E	Rubber strippers	2
23-209	Cam cover studs	2
23-90SB	Round belt hooks	3
12G 31-43	Lag screws	3
12G 31-54B.	Lamp shade	1
	Stitcher oil	11
Quart.	white wax	•1

(Additional operating supplies issued to the organization may be found in par. 42.)

b. AMERICAN MODELS B, C, AND CA. The sup-plies for American models B, C, and CA are listed below:

Supply Ust

Vendms part No.	Name	No. fltrnished
	No. SO needles.	12
	No. 47 awls	12
B-3-8	Bobbin	1
B-4-7C	No. SO needle guide	ī
	Needle guide fastening screw	2
	Long lip presserfoot	1
	Presserfoot fastening screw	1
	vVode table screw	
	Shoe guard	1
	SO-watt lamp (for 110-volt machine)	
B-13S	SO-watt lamp (for 220-volt mach ine).	1
ı	Machine oil	11
	\""lax	•1

ı Quart.

[•] Pol!Ind.

PART TWO OPERATING INSTRUCTIONS

Section IV. SERVICE UPON RECEIPT OF EQUIPMENT

9. New Equipment

- a INSPECTION FOR DAMAGE I SHIPMENT. When the stitcher arrives in its crate or package, check to see that the packing brace is still in place across the cam posts of the machine. If that brace is intact when the machine is uncrated, it is unlikely that any part of the stitcher has been damaged in shipment. If the supporting brace is loose and the stitcher has moved in the crate, check the exposed parts at the front of the head and the countershaft mounting at the rear of the base of the machine.
- b. REMOVAL OF CORROSION-PREVENTIVE MATERIAL. The machined parts of the stitcher not protected by a coat of paint are covered with a slushing grease when the machine is shipped. Remove the protective coating of grease and clean the operating parts of the machine thoroughly. The cleaning of the cams and cam races should be given special attention, because their wearing surfaces are easily damaged by the scouring action of dirt and grit. A mixture of Diesel fuel and machine oil makes a good flushing solution to use in the initial cleaning of the stitcher. The solution should not contain more than 15 percent machine oil.
- c INSTALLATION. (1) Motor drive. When a stitcher is equipped with motor, its installation is independent of the location of the finisher. The stitcher should be set up in a position that fits well into the normal flow of work from the jacks. It should be anchored to the floor if possible. When using a 2-inch power belt, a 3-inch pulley should be used on the motor, and an 8-inch pulley should be used on the countershaft. Y-belt operation requires a 3Yi-inch motor pulley and a 9-inch countershaft pulley. When the belts are in place, see that the voltage of the stitcher motor and heating elements corresponds to the voltage of the power line to be used.

- (2) Finisher drive. When the stitcher is to be driven from a finisher, the stitcher countershaft should be at least 6 inches to the rear of the finisher countershaft. The stitcher countershaft should run at a speed of 600 revolutions per minute in order to give the stitcher a speed of 250 to 300 revolutions per minute. A straight belt is used between the finisher and the stitcher, so that the stitcher counter-shaft will run in the same direction as the finisher countershaft. The round driving belts are crossed so that the top of the handwheel will turn to the rear.
- (3) Landis 12K-100 special unit. A stitcher and a finisher are combined in this unit and are mounted on a common base. The unit is used in the two-wheel shoe repair trailer. Installation is com- plete when the unit is unloaded and placed on level ground or flooring and the power lead is plugged into a duplex outlet in the power line. (See fig. 4.)
- d RuN-IN TEST. After the machine is installed, turn the handwheel slowly. It should turn smoothly without binding in the camshaft bearings or the cam races. As the wheel turns, check the position of the awl and needle and check to see that the relative positions of the needle, looper, lifter, and presser- foot are correct. If the machine appears to run smoothly during this slow operation, oil the machine, plug in the electric cord, and turn the motor switch on. Block the power treadle down and run the ma- chine for about 4 hours. The machine should not be left running unless an operator is present to stop it at the first sign of mechanical failure. After the run-in test, check the machine again. Make any adjustments that are necessary, as described in paragraphs 56 through 67.

10. Used Equipment

The original service upon the receipt of new equipment also applies to the receipt of used equipment. In addition, check the cam races and cam-shaft bearings for signs of excessive wear.

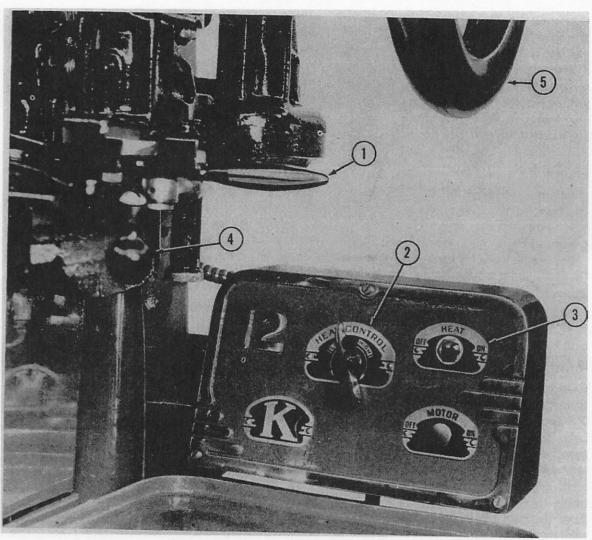
Section V. CONTROLS AND INSTRUMENTS

11. Heat Switch

The heat witch (3, fig. 7) i mounted on the upper right-hand corner of the control panel. The ON and OFF po itions are marked plainly on the witch plate. Flip the toggle switch to the right to turn the heat on and flip the switch to the left to turn the heat off.

12. Heat Control

The heat control (2, fig. 7) is located on the top center of the control panel. Wh n the heat has been turned on, the heat control allows the operator to regulate, behveen HIGH and LOW positions, the amount of current that goes into the heating elements of the machine. HIGH and LO"W are plainly indicated on the heat control plate. Turn the indi-cator to the left as far as it will go to set the heat control at LOvV. The LO"W position is used to hold the temperature up during brief pauses in



Ref . .Yo.	.N01nc,sc/att,re
1 2 3	Feed and guide handle. Heat control.
3	Heat switch. hoe guide shifter handle
5	Handwheel.

Figure 7. Controls (Landis model K).

operation. \i\Then more heat is desired, turn the indicator to the right until the proper amount of heat is being delivered to the machine. To get the greatest amount of heat that the heating elements can deliver, turn the indicator to the right as far as it will go, to the HIGH position. The HIGH position is used to warm up the machine before operation begins, and it may be used during operation in cold operating conditions.

13. Motor Control

The motor control switch (8, fig. 1) is no longer found on the control panel even though a plate for the switch may still be seen on the control panel. In order to use a switch with a thermal overload protection, the switch is mounted as a separate unit. It is located underneath the tool tray on the right- hand side of the support column. To start the motor, press the top button in the switch box. To stop the motor, press the bottom button .

14. Stitch Control

The feed and guide handle (1, fig. 7) is located

at the right front of the base of the stitcher head. This hanclle allows the operator to regulate the length of each stitch as it is sewed in the sole of the shoe. The handle has a forward and a rear posi- tion, but it can be set at intermediate points between those positions. To lengthen the stitch, pull the lever forward. To shorten the stitch, push the lever to the rear of the machine.

15. Shoe Guide

The shoe guide is located in the center of the face of the stitcher head. The shoe guide shifter handle (4, fig. 7) that regulates it is located at the right front of the base of the stitcher head. The shoe guide determines ho far from the edge of the sole the stitches will be made. To bring the stitching nearer to the edge of the sole, pull the shoe guide shifter handle forward. To move the stitching far- ther in from the edge of the sole, push the shifter handle to the rear of the machine.

16. Presserfoot Treadle

The presserfoot treadle (12, fig. 1) is located at the right front of the base of the stand. The presser- foot is located above the work table in the center of the face of the stitcher head. It holds the welt

and the sole down on the work table during the stitching operation. ',i\Then the operator steps on the presserfoot treadle, he raises the presserfo?t and releases the thread lock and the thread tension. Re-moving the pressure from the presserfoot treadle lowers the presserfoot and reestablishes the tension and the lock on the thread.

17. Power Treadle

The power treadle is located at the left front of the base of the stand. (See 13, fig. 1.) Stepping on the treadle engages the clutch on the power shaft at the rear of the machine, activating the power belt wheel and setting the stitcher head in motion. In- creasing the pressure on the treacUe increases the speed of the stitcher until the treadle is at its bottom position and the stitcher is running at top speed. Releasing the treadle disengages the clutch and causes the titcher to come to a stop.

18. Presserfoot Lever

The presserfoot lever (2, fio-. 1) is the hand con-

trol for the presserfoot. It is located in the center

of the face of the stitcher head. It may be used when the spring in the presserfoot treadle linkage fails to pull the presserfoot completely down on the work when the treadle is released. To raise the presserfoot, pu h the presserfoot lever up and to the rear of the machine. To lower the presserfoot, pull the lever forward and down.

19. Bobbin Winder Shift er Handle

The bobbin winder is located at the rear of the left-hand tool shelf. The bobbin winder shifter handle (19, fig. 1) starts and stops the bobbin winder. To start the bobbin winder, pull the shifter handle forward. To stop the bobbin winder, push the handle toward the rear of the machine.

20. H andwheel

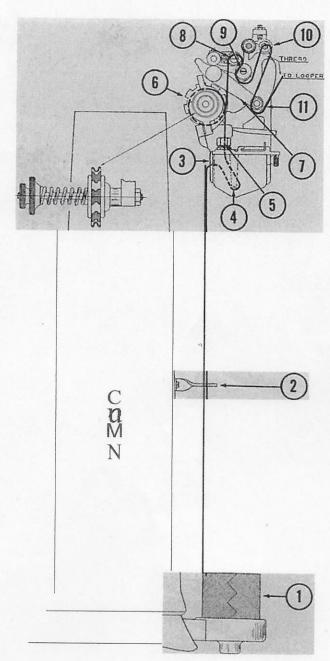
The handwheel at the right side of the stitcher head is used as the control handwheel. (See 3, fig. 1.) To start the machine, grasp the top of the handwheel with the right hand and push it bacbvard and clown. Step on the power treadle and the clutch will engage, and the stitcher will be set in motion. To stop the stitcher with the sewing parts in the desired position, release the power treadle and grasp the handwheel. The handwheel is also used, when

the clutch is not engaged, to tw-n the camshaft slowly to get a certain desired alignment of the parts of the stitcher head.

Section VI. OPERATION UNDER USUAL CONDITIONS

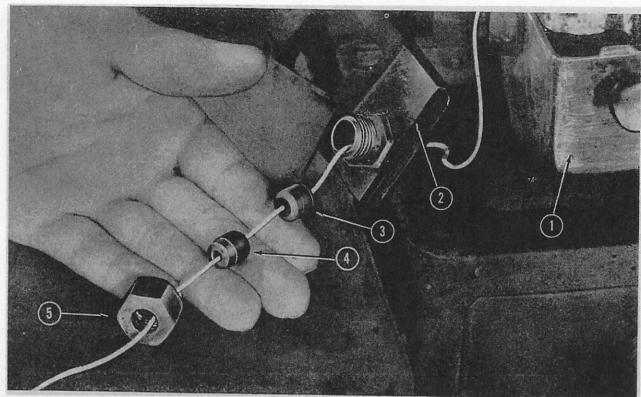
2 1 . Threading Machine with Needle Thread (fig. 8.)

- a. Place a spool of thread on the needle thread holder. This thread holder is located on the right side of the front of the column. (See 1, fig. 8.)
- b. Pass the thread up through the hole in the thread guide. The thread guide (2) is located above and to the right of the stitching spool.
- c. Loop the thread over a needle to use the needle as a thread guide. Pass the thread through the hole on the right side of the back of the wax pot (3).
 - d. Remove the top of the wax pot.
- e. Pass the thread down through the right hole in the wax fork (4) so that the thread will come up between the forks.
- f. Then pass the thread through the wa.'C stripper (S) that is on top of the wax pot. If the wax stripper is new and tight, it must be disassembled (fig. 9) before the thread can be passed through it. Ordinarily, the threading wire and thread will pass through it without disassembly. If disassembled, pass the threading wire and thread through the rubber stripper, the metal wax pot stripper stud, and the wax pot stripper binding screw, in that order.
- g. Reassemble the stripper. Make sure the wax forks are facing down in the wax pot, then fasten the wax pot top to the wax pot. Pull the thread out above the wax pot about 1 foot.
- h. Place the thread on the tension wheel. (See 6, fig. 8.) Step on the presserfoot treadle to release the tension wheel. Turn the tension wheel up and away until the thread has made one complete turn around the wheel.
- *i*. Pass the thread up the right side of the thread lock lever (7).
 - j. Around the thread-m easuring roller (8).
 - li. Down and under the thread lock roller (9).
 - 1. Up and over the auxiliary take-up roller (10).
 - 111. Down to the take-up lever roller (11).
- 11. Through the eye of the thread looper. (See 1, fig. 10.)
 - o. And through the plate. (See 2, fig. 10.)



Ref.	
No.	Nom, enclature
1	Needle thread.
2	Needle thread guide.
3	Thread hole in wax spot.
4	Thread fork.
4 5 6 7 8	\Vax stripper.
6	Tension wheel.
7	Thread Jock lever.
8	Thread-measuring- roller.
9	Thread lock roller.
10	Auxiliary take-up roller.
11	Take-up lever roller.

Figure 8. Threading diagram for needle thread.



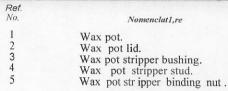
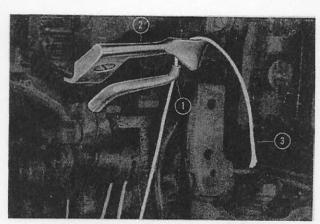


Figure 9. Threadillg disassell1bled wax pot stripper.



Ref.
No.

Nomcnclat!!!·e

Eye of looper.

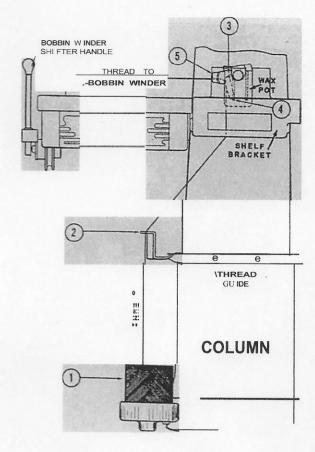
Needle plate.

Needle thread.

Figure 10. Threadillg looper and needle plate.

22. Threading Machine with Bobbin Thread (fig. 11.)

- a. Place a spool of thread on the bobbin thread holder. This thread holder is located on the left side of the front of the column. (See 1, fig. 11.)
- b. Pass the encl of the thread between tension disks and through the hole in the thread guide (2), which is located directly above the bobbin winder spool.
- c. Through the hole in the left side of the back of the wax pot (3).
- d. And down through the in ide of the left thread fork. (See 1, fig. 12.)
- e. Loosen the tripper binding screw and pass the thread through the str ipper. (See 2, fig. 12.) C\iVhen wax is put into the wax pot, the binding screw must be tightened enough to strip excess wax from the thread. See par. 59.)



Ref. No.	. Yomcuclaiure
1 2 3 .j	Bobbin thread. Bobbin thread guide, Thread hole in wax pot. Thread fork. \'a: stripper.

hgur 11 Bobbin thread threading diagram.

Hard, Yax 1s u ed in the \Y ax pot. t ee 1. fig. 9.)

23. Wax

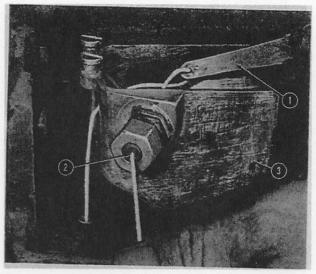
Break the \Ya., in small pieces ro put it into the wa..""

pot. Do not fill the wa., pot ,rith \Yax. It i ea:::ier

o c utrol the condition of the wa."C when he pot i
kept half full and ire h wa., is added when it i:::
neederJ. LeaYe enough wax in the hortom oi the pot
to melt new wa., when it i added. \\'a..., that boilor i: ha ed ior any leng h oi time turn black and
becomes brit le. \\'ax in thi condition harden::
,quic ly. The wa.,ed thread then become tiff and will
not lie in the barb oi the needle properly and frequen ly
break- when it is pullina in he bobbin Thread.

24. Heatino Machine

a. GEXERAL Heating the machine i one of the most important factors in the successful operation of the titcher. Heated to the right temperature. wax i a lubricant. It ,\ill aid in pa sing the thread ea ily throurth the thread-handling mechani ms of the stitcher and through the ole. The wax pot and the thread-handling mechani. III are heated with electrical heating element. \\heather hen the titcher is operating. the temperature of the wax in the wa.-x: pot hould be held at about 190° F. Heating elements at other point on the titcher keep the wax on the thread from cooling too much before the thread i. ,e\\heather ed. A thermo tatic control hold the



Rd. S:,.	.Yumc:nclacur,
2	\\ a: pot thread iork \\ a.x pot* tripper.

Figure L:. Thr,adi,,g ,,'1'1.r pot thread fork and stripper.

heat at the point cho en on the control panel by the operator.

b. OPER.nrn.-. Heat hould be turned on at lea-t 30 minute:: beiore titchinrr i begun. To turn the heat on. flip the heat -witch in the control panel to O_-. ee 3. fi.rr. 7.) (\Yith an .-\.merican model. pu::h the Q-button in.) Turn the indicator of the heat control (2. fi.rr. 7) toward the HIGH position as far a. it will go. The HIGH po:::ition will keep the wa.."C a he proper temperature for .ewing. The wa.., i melted enou h to ew when the thread can be pulled ea:ily by hand. To keep the machine warm

between operation \cdot turn the indicator oi the heat con rol to the LG\\- po-ition. In the LO\\ po ition.

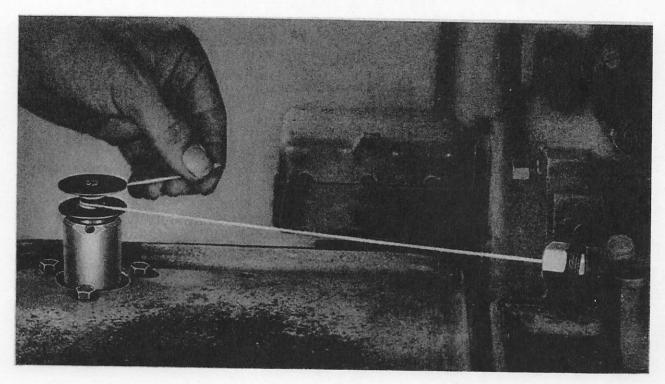


Figure 13. Preparation for winding babbin.

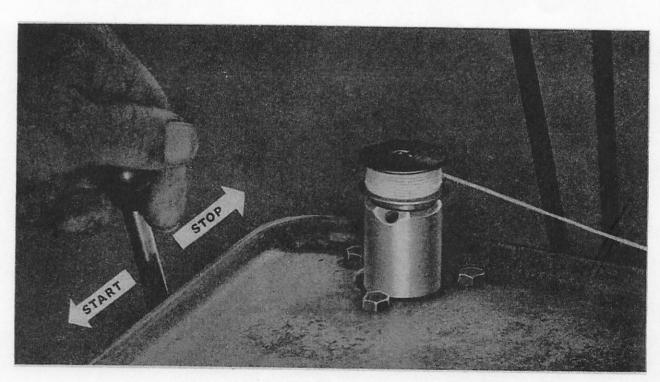


Figure 14. Bobbin winder colltrol

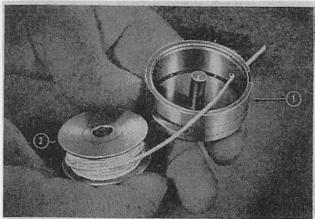
a small amount of current keeps the stitcher from getting cold. The stitcher can be heated to the proper sewing temperature again in 5 to 10 minutes by turning the heat control indicator back to HIGH.

25. Winding Bobbin

- a. Pass the thread through the hole in the side of the bobbin until it extends about an inch beyond the bobbin.
- b. Place the bobbin on the winder thread side fir t so that when the bobbin is clamped on the bobbin winder the thread will be held fast. Vind at lea t three loops of thread around the bobbin by hand so that winding will start easily when the bobbin winder hifter handle is engaged. (See fig. 13.)
- c. tart the bobbin winder by pulling the bobbin winder hand lever toward the operator. (See ti.CY. 14.)
- d. Vind the bobbin until the thread i flush with the sides. If the wound thread extends beyond the sides of the bobbin, the bobbin will not fit in the bobbin ca e.
- e. When the bobbin is full, disengage the bobbin winder by pushing the bobbin winder hand lever away from the operator.
- f. Cut the thread about 2 inches from the stripper so that enough thread hangs out of the heat guard to start the next bobbin. Remove bobbin from winder.

26. Placing Bobbin in Bobbin Case

a. Pas the cut end of the thread through the hole in the bobbin ca e. (See fig. 15.)



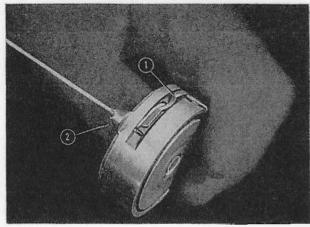
Ref.
No. It anicode file

| Bobbin case.
| Bobbin.
| FigIwe 15. First step in threading bobbin case.

b. Place the bobbin in the case so that the thread will unwind in the opposite direction to that in which it was wound on the bobbin.

c. Pa s the thread under the tension spring. (See 1, fiey. 16.)

d. And through the horn of the bobbin case. (See 2, fig. 16.)



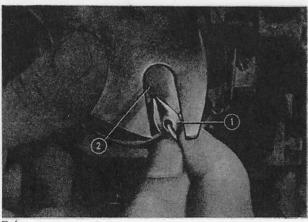
Ref. No.	Nomen clut u.re
I	Tension spring.
2	Horn of bobbin case
	Figlire 16. F111al step in threading bobbin case.

27. Loading Shuttle (fig. 17.)

Lubricate the shuttle as de cribecl in paragraphs
 4-+ and -1-5.

b. Place the bobbin case in the shuttle so that the horn on the bobbin case (1, fig. 17) will fit into the slit in the cover (2.)

c. Push bobbin case guide down.



Ref.
No.
NomenclatHre

Horn of bobbin case.
Slit in shuttle cover.
Figitre 17. Proper position of bobbin case in shlttfle.

28. Matching Sizes of Needles, Threa ds, **Awls**, and Needle Guides

a. The following _izes hould be u ed together:

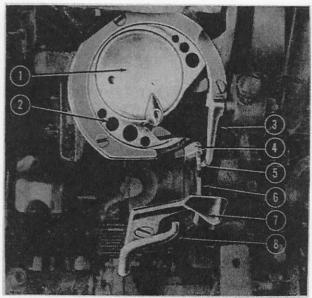
Xudlr (.\"s.)	Aw/ (1\'o.)	Xrcdlt- guide (X o.)	Inthread (cord)	Bobb, 11 tin-cad (cord)
45 or 24	43 Or 24	45 or 24	10 9	9
47 or 23	45 or 23	47 or 23	8	7
·0 or 22	47 or ?2	50 or 22	7	6
<i>52</i> or 21	· 0 or 21	52 or 21	6	
"4 or 20	·2 or 20	:4 or 20		4

b. The needle guide mu t be chanaed when the

needl, e ize i chanaed. The needle rruide i :tamped with the number of the needle with which it i to be used.

29. Setting Needle

a. The needle is et properly when the barb of the needle is 1 16 inch from the needle cruide at the time \\\\ hen the a,d i: feedino- to the left. (ee fig. lo.)

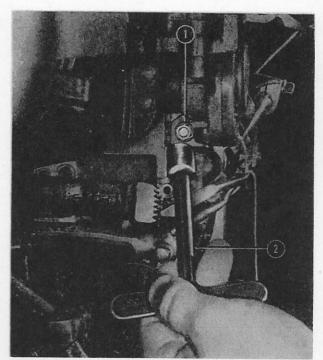


R.-:
Bobbin case.

-hunle.
Liiter.
- eedle guide.
- eedle.

- ...wl.
- _ cedle pla e.
Loope-.

Fig tr.- le. R.-lati..e osition o t':, I rts oj t/:(' ace.



Rej.

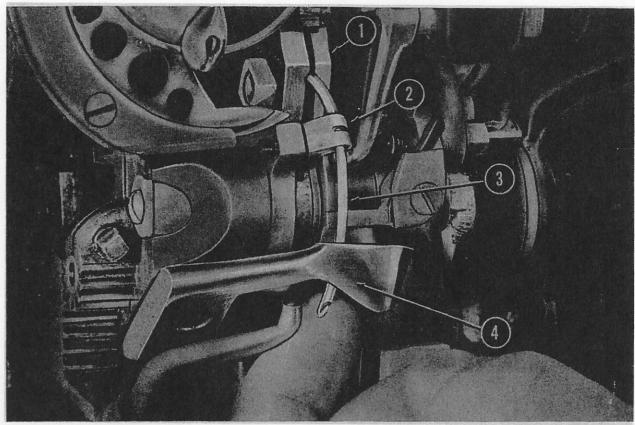
Nome-nciaiII.r...

I - eedle clamp nut.
- eedle clamp nut wrench.

F:gllrt J<; Clianglllg llt·,·dle.

c. Ii the needle i taken out when it point 1-16 inch aboYe the need'.e plate. it can be replaced without remo,'ino- the needle holder. For that rea-on. i-:: then pos.:ible to et he new needle (fig. 20) iairly clo.:e to the correct po ition the fir t time it i set. Then mrn the handwheel until bo h the needle and the awl are going down. t that po_ition. establish the correct relati,-e po ition of the needle and awl. .::ee fig. 21. Howeyer. as a jurther precaution, always check the needle with the needle guide at the point when the awl i feeding to the left.

\\"hen the needle elamp nut ecurely.



Ref.
No.

Nom-e11.clat11re

Needle clamp.
Leedle guide.
Needle.
Needle.
Needle plate.

Fignre 20. Inserting needl.e.

30. Setting Awl

a. The awl should be set 1/16 inch below the needle and about 1/32 inch to the left of the needle when both the needle and the awl are moving downward. (See fig. 22.)

b. To remove the awl, begin by throwing the shoe guide forward. (See 2, fig. 45.) Turn hand- wheel to bring awl holder up. Release the clamp nut. Hold the awl and turn the handwheel to back the awl holder away from the shank of the awl.

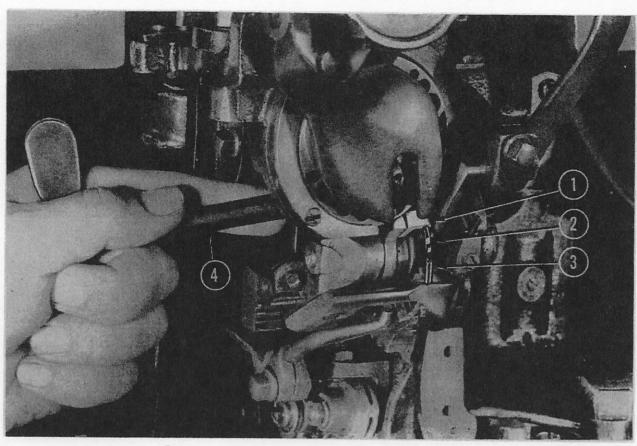
c. To set an awl in position (fig. 22), pass it up through the needle plate. Hold the awl and bring the awl holder up so that the shank of the awl will enter the groove of the holder. When the shank of the awl can be felt just protruding from the lower end of the clamp, tighten the clamp nut. if the awl is fastened in this way, the original setting

will be Yery close to the correct position. (See fig. 21.)

d. The awl springs out of alignment when 1t 1s feeding the shoe. For that reason, the awl should be set so that the awl hole will line up with the needle while carrying the work. The awl should be set to travel about 1/32 inch to the left of the needle at the end of the feed. That adjustment is made when the awl is set at the end of the feed.

31. Setting Lifter

a. The lifter (3, fig. 23) lifts the right-hand thread from the needle to the shuttle. It.should be set to pass as close to the point of the needle (4, fig. 23) as possible and directly in the center of the two threads. (See fig. 24.) There should be 1/32 inch between the lifter (1, fig. 25) and the shuttle (2, fig. 25) at the closest point.



R. f.
No.

X eedle !!"tlide.

X xeedle.

X xeedle.

X xeedle clamp nut wrench.

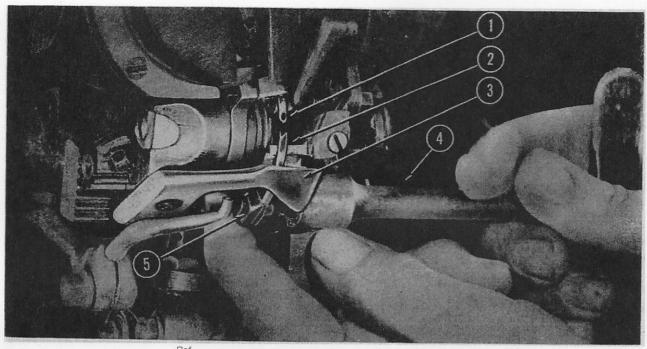
Figure 21. cttmg ne, odle to a-u.:l.

b. To adju-t the lifter. loo en the bindino- ere\\. (ee 1, fio-. 23.) The adju.tment of the lifter i controlled by mean- of an eccentric. (ee 2. fig. 23.) :.Im·e the lifter right or left to line up with the point of the needle. "·ing it in or out to clear the hurtle by 1 32 inch. } foye it up and down until it jut clear the point of the needle. Tighten the bindina screw. (ee 1. fiu-. 23.)

32. Operating Stitcher

- a. Tun1 the hand, Yheel o'Yer until the thread takeup lever (9. fiu-. 49) i- at it Jm, et point.
- b. 'Yith the left hand. gra p the -hoe "ith the sole facing up.
- c. tep on the pres.erfoot treadle to rai.e the pre-erfoot.
- d. Place the heel of the hoe under the shuttle ca-

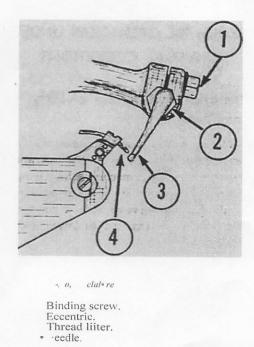
- e. Tilt the toe of the hoe upward until the welt clear the needle plate or "ork table and goe back again.t the hoe guide.
- f. Relea e the pre erfoot and set it firmly again t the ole of he shoe.
- g. Turn the handwheel until the awl pierce the .ole.
- h. Grasp the toe of the hoe in the riu-ht hand and the heel in the left hand.
- 1. tart ewino- by pre.. ing dm,n on the clutch pedal with the left foot.
- _i. A the ritchin<T approache- the toe of the hoe, ea-e the pr ure on the clutch pedal to lo,Y up the machine. A the rune' time hift the left hand to the left ide of he .hoe. and hiit the right hand to the right side of the hoe. Continue -ewing around the toe.



Ref.
So.

1 Xeedle.
2 .-\wl.
3 Xeedle plate.
J. Awl clamp nut \>Tench.
Awl clamp.

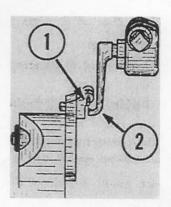
Figure 22. Sett111g aw/.



F1911r.-!::. Lijt.-r n, .-dlt spac, adj11st111,11t.

R, {.

.0.



Ref.
Xo.
Nomenclature
eedle.
Liiter.

Fig11r, 2./. r-arical aligm11c11t ni li"tor and needle.

Part 1

Operation, Maintenance & Repair Landis No. 12 Model K Sole Stitching Machine

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Pilgrim Shoe & Sewing Machine Company, Inc.

UPS/Freight Address: 150-V New Boston Street • Woburn, MA 01801

BOOK I STITCHING MACHINE

Landis No. 12 models F and K

American models B, C, and CA

Operation, Maintenance and Repair

Landis No. 12 Model K sole stitching machine.

Chapter 1, Section I

INTRODUCTION

1. Disclaimer

This manual is offered as a guide to shoe makers in the care and maintenance of their equipment. Pilgrim Shoe & Sewing Machine offers no guarantee as to the accuracy of this manual. If you are in doubt of your ability to undertake a repair to your machine, call a professional shoe machine mechanic.

2. Terminology

Throughout this catalog parts are referred to by name. For specific part numbers consult your Model 12 parts manual.

3. Scope

This manual contains instructions and information on the operation, maintenance and repair of the Landis No. 12 Model K sole stitching machine. These instructions will also apply to other Landis Model 12 machines.

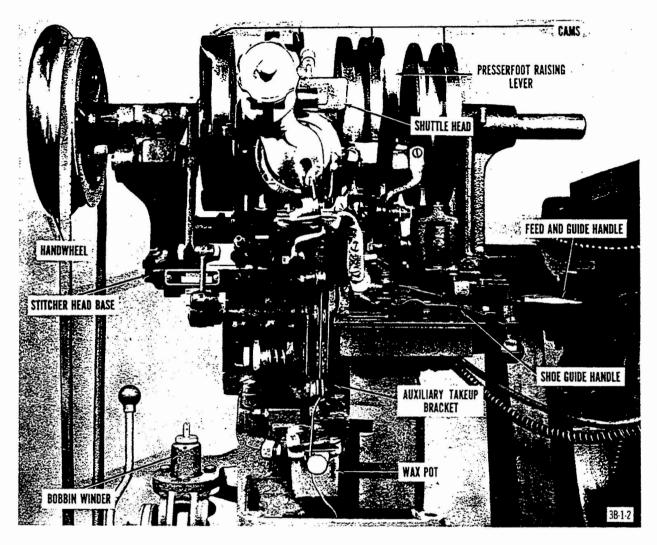


Figure 2. Head assembly.

4. Orientation

Throughout part one the terms right, left, front and rear indicate directions from the viewpoint of the operator facing the sole stitching machine in an operating position.

5. General

The Landis No. 12 Model K is a curvedneedle, lockstitch, electrically operated sole stitching machine. The sole stitching machine consists of a head assembly, which includes a wax pot; a presserfoot release treadle assembly; a foot treadle for the power clutch; and a bobbin winder.

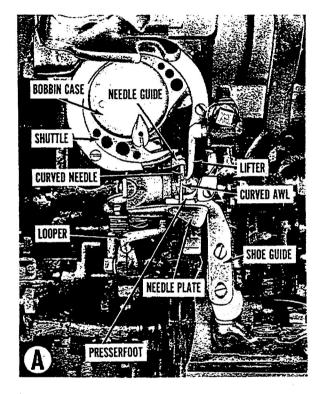
6. Head Assembly

a. General. The head assembly (fig. 2) is built around four cams fixed to a common cam-

shaft driven by a power belt attached to the power shaft in the unit frame. The cams, numbered from the left 1, 2, 3, and 4, control the sequence of operations of the functional parts of the head.

- b. Functional Parts of Head Assembly. Functional parts of the head assembly (fig. 3) are those which work in conjunction with each other to form and correctly place the proper stitch in the sole of the shoe.
 - (1) The curved awl (A, fig. 3) punches the hole in the sole of the shoe, at the same time moving the shoe to the left for the curved needle (A, fig. 3) to pass through the hole. It then feeds, or moves, to the right to punch the next hole.

- (2) The curved needle follows the awl through the hole in the sole and through the opening in the needle plate (A, fig. 3) until the needle reaches a point just below the plate.
- (3) The looper (A and B, fig. 3) together with the thread hook (B, fig. 3) holds the needle thread in such position that the thread may be looped over the barb of the needle. The needle then
- needle and, as it turns, drops it on the shuttle itself. As the shuttle continues to turn, it carries the thread around until it crosses the bobbin thread forming the lockstitch.
- (6) The takeup lever (B, fig. 3), moving downward to its lowest position, pulls the lockstitch down into the outsole of the shoe; at the same time the thread lock lever (B, fig. 3) locks or holds the





A-Actual stitching parts

B-Takeup lever and thread lock lever

Figure 3. Functional parts of head assembly.

moves back up through the hole in the sole until it reaches a point above and behind the lifter (A, fig. 3) so that the thread is placed in the path of the lifter.

- (4) The lifter raises the right thread of the loop from the needle and holds it free for the action of the shuttle (A, fig. 3). The needle continues back with the left thread of the loop to hold it taut.
- (5) The point of the shuttle picks up the needle thread from the lifter and the

- feeding thread until the stitch is in the sole.
- (7) The procedure is then repeated with the presserfoot (A, fig. 3) holding the sole to the needle plate and the shoe guide (A, fig. 3), guiding the shoe so that the stitch will be the proper distance from the edge of the sole.
- c. Wax Pot. The wax pot (fig. 2) is located at the center of the lower portion of the head assembly. When wax in the pot is properly heated and melted, it acts as a lubricant for the thread and aids in passing it through the

thread-handling mechanism of the stitcher. The wax also tends to strengthen and prolong the life of the thread and the stitch.

7. Bobbin Winder

The bobbin winder (B, fig. 1) is located on the left side of the stitching machine. It is used to rewind the bobbin with bobbin thread after the thread has passed through the wax pot.

8. Controls

- a. The following controls are mounted on a panel at the rear of the stitcher (B, fig. 1):
 - (1) The heat switch turns on current for the heating elements (par. 9).
 - (2) The heat regulator controls amount of heat used.
- b. The following controls are in the head assembly (fig. 2):
 - (1) The feed and guide handle regulates movement of the awl for length of stitch.
 - (2) The shoe guide shifter handle regulates the shoe guide to keep stitch proper distance from edge of sole.
 - (3) The presserfoot raising lever is used to apply pressure to the presserfoot and then to the shoe when starting to stitch.
 - (4) The handwheel (B, fig. 1) is mainly used to drive the machine, and also to stop and start the machine by hand and to move the functional parts when making adjustments.
 - (5) The bobbin winder shifter handle, attached to the left side of the bobbin winder (A, fig. 1), stops and starts the winder.
 - (6) The stitcher clutch treadle, located at the left front of the base of the machine (A, fig. 1), is used for operation as well as to regulate speed.
 - (7) The presserfoot release treadle, located at the right front of the base of the machine (A, fig. 1), is used to raise

- the presserfoot, release thread tension, and lower the thread lock.
- (8) The power switch is located at the rear of the stitcher, on the front of the finisher.

9. Heating Elements

- a. Heating the sole stitching machine is one of the most important factors in its operation. The machine will not operate properly unless the wax and the thread-handling parts are heated sufficiently to keep the wax soft and the thread moving easily during operation.
- b. There are three flat, conduction-type heat units. One is clamped to the shuttle head (fig. 2) for heating the shuttle and the thread in the bobbin. Two other heat units are clamped to the auxiliary takeup bracket to heat the takeup lever and thread rolls, and to heat the wax pot and keep wax at proper temperature of 190° F. (Fahrenheit).
- c. A thermostatic control (par. 20) keeps the machine from getting too hot.

10. Motor

One electric motor powers the Model 12 K.

The single-phase, 60-cycle, 100- to 120-volt motor develops $1\frac{1}{2}$ horsepower and operates at 1,750 rpm (revolutions per minute). The motor has thermal overload protection.

11. Performance

- a. Operating Speed. The countershaft of the combination unit should be run at a speed of approximately 600 rpm. At that speed the camshaft in the head of the stitcher will operate at the prescribed speed of 250 to 300 rpm.
- b. Operating Capacity. When the machine is run at the prescribed speed by a skilled operator and the welts and soles of the shoes are properly prepared for stitching, the stitcher will sew 30 to 40 pairs of shoes per hour.

12. Tools and Repair Parts

Lists of tools and repair parts for the stitching machine appear in paragraphs 204 and 205.

1

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

13. General

The stitcher head assembly is detachable from the Model 12 K-

14. Cleaning

Remove masking tape and rust preventive compound. Clean operating parts of head assembly with SD (Solvent, dry-cleaning). Do not use gasoline or abrasive materials. Pay particular attention to cam and cam races; their wearing surfaces are easily damaged by dirt and grit.

15. Inspection

Inspect head assembly thoroughly for broken, damaged, or loose parts. Examine all accessible wiring and conduits, heat units, and work light to see that they are in good condition and securely connected. See that clutch treadle and presserfoot release treadle are properly connected.

16. Lubrication

Lubricate all points of head assembly and other parts of stitching machine in accordance with instructions in paragraphs 33, 34, and 35.

17. Run-in Test

Perform run-in test in a, b, and c below to check action of machine and proper functioning through correct adjustments of all func-

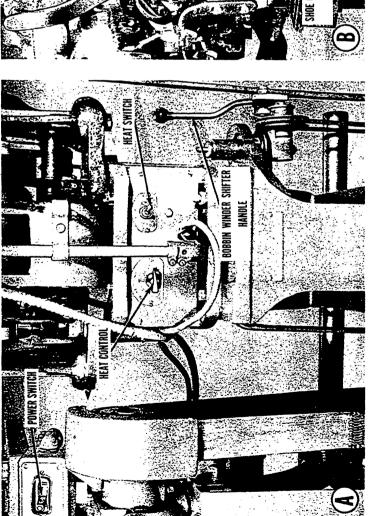
tional parts. During the run-in test, moving parts will act as their own abrasives, and action of the machine will tend to remove burs and rough edgings on the parts.

- a. Turn handwheel forward slowly; it should turn smoothly without binding in the camshaft or cam races. As the wheel turns, check position of awl and needle, and make sure that relative positions of lifter, looper, thread hook, shuttle, and presserfoot are correct in accordance with instructions in paragraphs 45 through 55. Make any necessary adjustments.
- b. When the machine appears to run smoothly during this slow operation, plug in power line and turn power switch (A, fig. 4) to ON. Block clutch treadle down and run machine for 4 hours with periodic halts for check of positions of functional parts of equipment and for any necessary adjustments.
- c. Do not leave machine running unless operator is present to stop machine at first sign of mechanical failure.
- d. Prepare and test machine for proper stitching (par. 29).

18. Correction of Deficiencies

Treat deficiencies disclosed during inspection and testing as follows:

- a. Correct those deficiencies within the scope of organizational maintenance.
- b. Refer those beyond the scope of organizational maintenance to a higher echelon for correction.
- c. Refer those of a serious nature to the supplying organization through proper channels.





B-Controls on front of head assembly A-Controls on panel at rear of machine

Figure 4. Stitching machine controls.

Section II. CONTROLS AND INSTRUMENTS

19. Heat Switch

The heat switch (A, fig. 4) is mounted on the upper right hand corner of the control panel on the rear of the stitcher. ON and OFF positions are marked on the switchplate.

20. Thermostatic Heat Control and Heat Control Switch

a. Thermostatic Heat Control. The Landis No. 12 Model K stitching machine is equipped with an automatic thermostat heat regulator which prevents the machine from overheating. A capillary tube extends from the body of the thermostat to a thermostat feeler bulb attached to the auxiliary takeup bracket. This feeler bulb contains a thermal element which is responsive to an increase in heat beyond the maximum temperature of 190° to 200° F. required for operation of the machine. The thermal element reacts to extreme temperatures to move a diaphragm, opening an electric switch in the body of the thermostat and breaking the circuit. When the machine cools sufficiently, liquid in the thermal element contracts to close the switch.

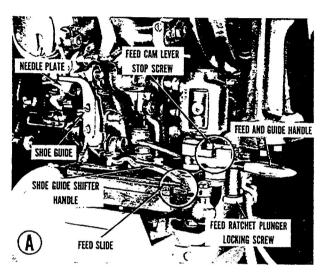
b. Heat Control Switch. A manually-operated heat control switch on the control panel (A, fig. 4) determines the amount of current that will be supplied to the heating elements (par. 9). When the indicator is in the LOW position, enough current is supplied to keep the machine warm during longer than ordinary pauses during operation. When the indicator is in the HIGH position, the full load of the current is supplied to the heating elements to warm the machine and maintain it at the proper operating temperature.

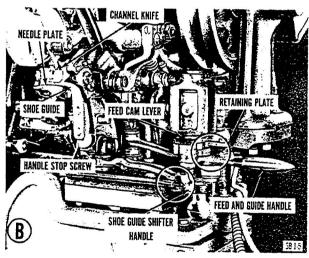
21. Power Switch

The power switch (A, fig. 4) is on the front of the finisher portion of the stitcher-finisher unit, and to the left of the control panel on the rear of the stitcher. Power switch ON and OFF positions are marked. When the switch is in the ON position, the motor turns the drive shaft to transfer movement to the stitcher (or finisher) and the bobbin winder when the clutches are engaged.

22. Feed and Guide Handle (Stitch Control) The feed and guide handle (B, fig. 4) regulates the length of each stitch as it is sewed in

the sole of the shoe. The handle has forward and rear positions, but can be set at intermediate points between these positions. Loosen feed ratchet plunger locking screw (A, fig. 5) to move feed and guide handle. Retighten locking screw after adjustment has been made.





A—Set for long stitch for combat shoe rubber soles
 B—Set for short stitch for low-quarter shoe leather soles

Figure 5. Shoe guide and stitch controls set for proper stitching.

- a. To lengthen stitch, move handle forward until it touches feed cam lever stop screw (A, fig. 5).
 - b. To shorten stitch, move handle to rear,

lining up oilholes in cam lever and retaining plate (B, fig. 5).

23. Shoe Guide Shifter Handle (Shoe Guide)

The shoe guide (B, fig. 4) determines how far from the edge of the sole the stitches will be made.

- a. To move stitching away from edge of sole, pull shoe guide shifter handle (A, fig. 5) forward until it is flush with edge of feed slide.
- b. To bring stitching closer to edge of sole, move shoe guide shifter handle to rear as far as possible. Handle stop screw should be in far enough so guide does not come too far forward and block opening in needle plate (A, fig. 5).

24. Presserfoot Raising Lever

The presserfoot raising lever (B, fig. 4) is the hand control for the presserfoot and is used to apply additional pressure on the shoe when starting to stitch. To apply pressure, pull handle forward, then release.

25. Handwheel

The handwheel (fig. 2), on the left end of the camshaft, is used to stop and start the machine by hand. The handwheel is connected to the drive pulley on the power shaft by a belt to drive the head of the machine. In starting the machine, push handwheel to the rear, step on clutch treadle, and stitcher will be set in motion. To stop stitcher, release clutch treadle and hold handwheel. The handwheel always turns to the rear in operation, and is turned forward only to make certain adjustments.

26. Presserfoot Release Treadle

Downward action of the presserfoot release treadle (A, fig. 1) raises the presserfoot (A, fig. 3), releases pressure on the thread tension wheel (B, fig. 3), and lowers the thread lock. This allows a shoe to be placed in the machine or more thread to be pulled out if necessary. Releasing the treadle lowers the presserfoot and reestablishes thread tension and thread lock.

27. Clutch Treadle

Downward pressure on the clutch treadle (A, fig. 1) engages the stitcher clutch (A, fig. 1) on the power shaft to activate the stitcher drive belt and set the stitcher in motion. Increasing pressure on the treadle increases the speed of the stitcher until the treadle is in its bottom position and the stitcher is running at maximum speed. Releasing the treadle disengages the clutch and stops the machine.

28. Bobbin Winder Shifter Handle

The bobbin winder shifter handle (A, fig. 4) stops and starts the bobbin winder. Pull shifter handle forward to start bobbin winder; push handle to rear to stop.

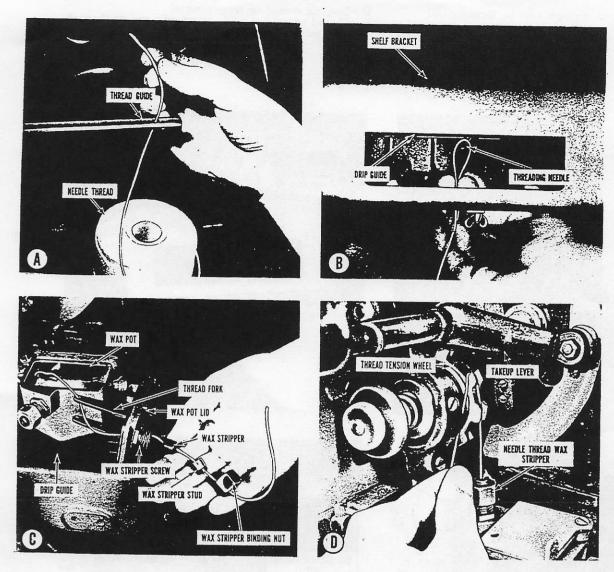
Section III. OPERATION UNDER USUAL CONDITIONS

29. Preparation for Operation

- a. Heating Machine. Turn on heat at least 30 minutes before stitching begins, to heat machine thoroughly and raise temperature of wax to 190° F. Heat is turned on by placing heat switch in ON position and heat control to HIGH position.
- b. Lubricating. While machine is heating, lubricate completely (pars. 33-35).
 - c. Filling Wax Pot.
 - (1) The wax pot should be at least half full and the wax clear and yellow. It is easier to control condition of the wax when pot is kept at this level. Fresh wax is then added when needed.
 - (2) Always have enough wax in the pot to help in melting new wax when it is added.

- (3) Wax is supplied in a hardened cake form. Break wax in small pieces, place in wax pot, and add more wax as needed.
- d. Matching Sizes of Needles, Awls, Threads, and Needle Guides.
 - All needles, awls, threads, and needle guides must be properly matched in size for proper operation of stitcher.
 - (2) The awl and needle guide will be changed every time the needle size is changed. The needle guide is stamped with the last number of the needle with which it is to be used.
 - (3) The following sizes should be used together:

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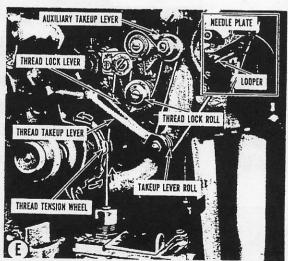
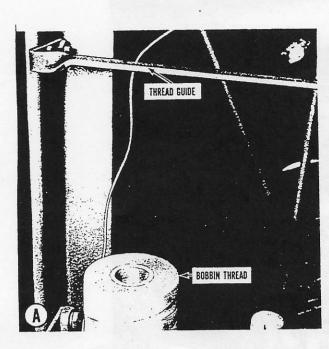
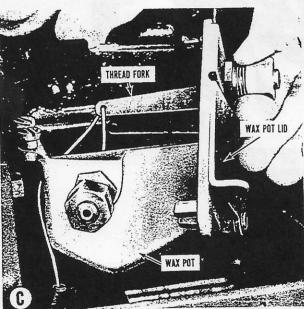


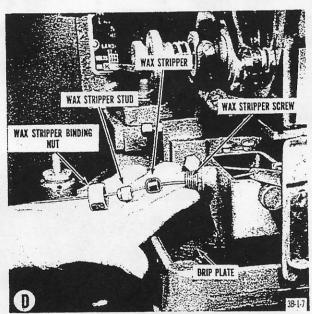
Figure 6. Threading machine with needle thread.

Figure 6-Continued.









A—Thread passing through rear hole in thread guide B—Passing thread through left hole in drip guide

Figure 7. Threading machine with bobbin thread.

C—Passing thread through left hole in wax pot and left fork
 D—Passing thread through side wax stripper

Need	le No.	Awl	No.	Needle guide	Top thread	
Landis	USMC.	Landis	USMC.	No.	Cord	Cord
24	45	24	43	4	10 or 9	9 or 8
23	47	23	45	3	8	7
22	50	22	47	2	7	6
						- II

*United Shoe Machinery Corporation

- e. Threading Machine With Needle Thread. Refer to figure 6 and proceed as follows:
 - Place spool of thread on needle thread holder at front left side of frame. Be sure number inside spool is at top.
 - (2) Pass thread up through hole in thread guide (A).
 - (3) Use curved needle for threading guide, loop thread over barb of needle (B), and pass thread through right hole in drip guide.
 - (4) Remove wax pot lid by loosening thumbscrew on front of wax pot.
 - (5) Pull thread through right hole in rear of wax pot and then through right fork on wax pot lid from right to left (C).
 - (6) Disassemble wax pot stripper located on top of wax pot lid. Using stripper wrench, remove nut by turning to left and then remove stud and stripper (C).
 - (7) Use needle to pull thread through stripper screw, stripper, stud, and nut, making sure that small part of stud is up and faces nut.
 - (8) Reassemble stripper assembly and tighten nut.
 - (9) Place lid on wax pot and tighten thumbscrew enough to hold.
 - (10) Adjust wax pot stripper (par. 55b) to provide sufficient wax for proper action.
 - (11) Turn handwheel until takeup lever (D) moves up enough to clear thread tension wheel.
 - (12) Pull thread through stripper and form loop over one cog on tension wheel (D).
 - (13) Step on presserfoot treadle to release tension on tension wheel; turn wheel to rear until thread has made one complete turn. Thread will then

- come from wax pot to left and around to where threads come together (E).
- (14) Use curved needle as guide and pass thread up behind takeup lever and thread lock lever (E), and over rear of thread measure roll behind guard and down front of roll.
- (15) Step on presserfoot lever to lower thread lock lever (E) and pass thread under thread lock roll.
- (16) With loop of thread over needle barb, pass thread around rear and down front of auxiliary takeup lever roll (E).
- (17) Bring thread down to and around thread takeup lever roll (E).
- (18) Turn handwheel until looper (E) is in line with hole in needle plate, and pass thread through looper and needle plate.
- (19) Place takeup lever in its lowest position and check thread tension by pulling on thread. Thread should pull freely without binding or without being too loose. If thread binds, turn thread tension adjusting disk forward to loosen tension.
- f. Threading Machine With Bobbin Thread. Refer to figure 7 and proceed as follows:
 - Place spool of thread on bobbin thread holder at rear on left side of frame. Be sure number inside spool is at top.
 - (2) Pass thread up through hole in thread guide (A).
 - (3) Use curved needle as a guide, loop thread over barb of needle, and pass thread through left hole in rear of drip guide (B).
 - (4) Remove wax pot lid and pass thread through left hole in rear of wax pot and through hole in left fork on wax pot lid from right to left (C).
 - (5) Disassemble stripper on left side of wax pot (D), thread stripper, and reassemble (e(6)-(8) above).
 - (6) Replace wax pot lid, and tighten thumbscrew securely.

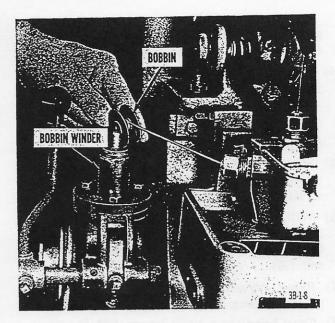


Figure 8. Placing bobbin on bobbin winder.

(7) Adjust stripper for proper amount of wax on thread.

g. Winding Bobbin. Before operation and from time to time during operation it is necessary to rewind bobbin with bobbin thread after removing bobbin from shuttle case and bobbin case (A, fig. 3).

(1) Place bobbin on bobbin winder with bearing surface of bobbin down (fig.

(2) Wind thread around bobbin 3 turns.

(3) Start motor and engage bobbin winder by moving shifter handle forward.

(4) When sufficient thread has been wound on bobbin move shifter handle to rear to stop bobbin winder.

(5) Cut bobbin thread 3 inches from wax pot and remove bobbin from spindle.

(6) Thread bobbin case as follows:

(a) Pass end of bobbin thread from bobbin through hole in side of case (A, fig. 9).

(b) Place bobbin in case with bearing surface down, pass thread through horn in bobbin case, and pull thread down in between tension spring (B, fig. 9).

(7) Lubricate shuttle, needle guide, needle segment, and awl segment (par. 34).

(8) Place bobbin case in shuttle with horn in proper position (C, fig. 9).

(9) Check tension of bobbin thread by pulling on thread. Thread should pull easily and without binding. To adjust, turn eccentric (B, fig. 9) to left to increase tension.

h. Adjusting for Proper Stitching. Before operation, the machine must be adjusted for type of material to be used and type of shoe to be repaired. The feed and guide handle (par. 22) and shoe guide shifter handle (par. 23) are used for this adjustment. In addition, the presserfoot channel knife (B, fig. 5) must be raised or lowered as necessary. Always set machine for proper stitch before adjusting channel knife.

(1) Rubber (usually used for combat shoes).

(a) Rubber soles require a long stitch; just as described in paragraph 22a.

(b) Combat shoes require heavier soles than low-quarter shoes. To keep stitching at full strength, stitching should be farther in than usual from edge of sole; adjust shoe guide (par. 23a).

(c) The channel knife should never be used on rubber as it will split the sole, and the stitch will pull too deeply. Raise channel knife (par. 54α).

(2) Leather (usually used for low-quarter shoes).

(a) Leather soles require a short stitch; adjust as described in paragraph 22b.

(b) Stitching is closer to edge than in combat shoes; adjust as described in paragraph 23b.

(c) Lower and adjust channel knife (par. 54).

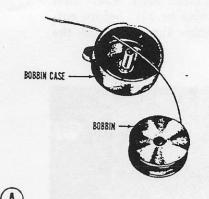
i. Checking Thread Tension. Thread should pull easily and without binding.

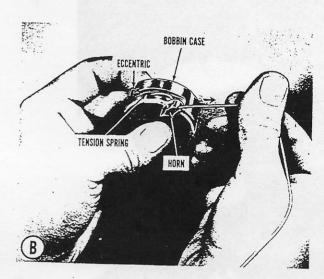
j. Checking for Proper Stitching.

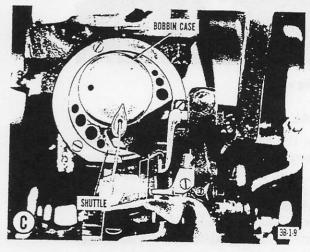
(1) Turn on power switch.

(2) Use a piece of scrap material (either leather or rubber, depending on type of shoe to be repaired) and make a few stitches, following procedure for sewing in paragraph 30.

(3) Cut away edge of sole until thread lock is exposed. Lock should be in the







A—Thread passing through hole in bobbin case B—Threading horn and tension spring C—Bobbin case in shuttle

Figure 9. Bobbin case threading.

center of material (par. 50). Make adjustments if necessary.

k. Wetting Sole. Dip sole of shoe into a pan of water and hold sole under water briefly. Water makes sole and welt more flexible and reduces amount of needle breakage.

30. Operation of Stitcher

a. Turn handwheel toward rear until takeup lever is in its lowest position and needle and awl are clear to needle plate (B, fig. 3).

b. Step on presserfoot treadle to raise presserfoot, release thread tension, and lower thread

lock lever.

c. Holding heel of shoe with left hand and toe in right hand, place shoe in machine with sole facing up (fig. 10).

d. Set sole on needle plate with edge resting against shoe guide. The shoe should be placed so that stitching may start 3 to 5 stitches behind splice line for a half sole. For a full sole, start at point where welt ends (fig. 10).

e. Release presserfoot treadle and pull down on presserfoot hand lever to set presserfoot

firmly in place on sole.

f. Turn handwheel to rear until awl pierces sole.

g. Step on power treadle to start operation of machine.

h. Hold shoe firmly, but do not press, pull, or twist shoe. It is necessary only to guide the shoe. Action of the awl will feed or move shoe as it is being stitched.

i. As the stitching rounds the toe, gradually shift left hand toward toe and right hand toward heel. Continue stitching 3 to 5 stitches beyond splice line. If necessary, pressure on power treadle may be eased to slow machine as stitching approaches and rounds the toe.

j. When stitching is completed, release power treadle and grasp handwheel to allow it to turn only enough to complete the last stitch and

bring needle and awl free of shoe.

k. Step on presserfoot treadle to raise presserfoot and relieve tension and lock on thread.

l. Pull shoe forward out of machine and cut bobbin thread 3 inches from bobbin. Continue pulling on shoe and cut needle thread 12 inches from needle plate to leave enough thread to prevent it from being pulled down through needle plate and looper when machine is being set for next shoe.

m. Cut threads where stitching finishes on shoe. First cut bobbin thread where it comes out of sole, then cut needle thread where it comes out of welt. Be careful not to cut shoe with knife.

- n. Thread extending from place where first stitch was made must also be cut; before cutting, pull needle and bobbin threads to lock the stitch in sole.
 - o. Turn off motor.

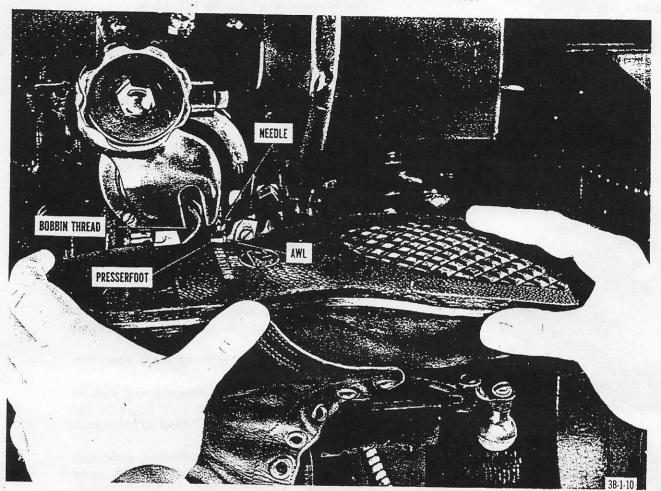


Figure 10. Shoe held in position for stitching operation.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

31. Dusty or Dirty Conditions

- a. Shorten service and lubrication intervals to keep machine clean and well lubricated at all times for proper operation.
- b. Remove all sand and grit from shoes to be stitched. Sand and grit will work into parts of the machine and cause needle and awl breakage during stitching.

32. Extreme Heat or Cold

a. Extreme Heat. Any heat in which the operator can work will affect nothing in the machine but the wax. Condition of the wax

should guide the operator in adjusting the heat control to compensate for high air temperature around the machine. Wax should not be allowed to boil as it will become burned and hardened, affecting operation of the machine.

b. Extreme Cold. Total wattage of the heating elements of the stitcher will not keep the wax or the machine warm enough for proper operation if air temperature falls below 60° F. Equipment should be set up in a heated tent, if possible, and every effort be made to protect wax and thread-handling mechanism from cold drafts.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE

Section I. LUBRICATION

33. Preparation for Lubrication

Clean all parts of stitching machine thoroughly (par. 37) before lubricating. Allow all parts to dry before lubrication.

34. Head Assembly

- a. The lubrication chart (fig. 11) prescribes lubrication points, intervals, procedures, and lubricants for the head assembly of the sole stitching machine. The head assembly must be lubricated every 4 hours, and observance of all instructions in the lubrication chart is essential to proper maintenance and operation of the machine.
- b. Arrows, on the illustrations of the lubrication chart, indicate oilholes and reservoirs for lubrication points, with the following exceptions to which points lubricant is applied directly: cams (1, left front view), auxiliary takeup lever (5, left front view), needle guide, needle segment and awl segment (15, right side view), and looper cam lever slide block (4, rear view).

35. Additional Lubrication Points

In addition to the head assembly, the following additional lubrication should be performed as indicated in a through c below.

- a. Twice each day, lubricate the following parts with 2 or 3 drops of prescribed lubricant:
 - (1) Lubricate bobbin winder shaft and bobbin winder shifter lever shaft (A, fig. 12) with OE-50 (lubricating oil, internal combustion engine).
 - (2) Lubricate the following points on the stitcher clutch assembly (B, fig. 12) with OE-10 (lubricating oil, internal combustion engine).
 - (a) Drive pulley oil point.
 - (b) Treadle shaft at front and rear brackets, and treadle fork disk.
- b. Once a month lubricate motor (A, fig. 1) by filling hinged cup oilers with OE-30 (lubricating oil, internal combustion engine).
- c. Lubricate drive shaft bearings in accordance with instructions contained in paragraph 94.

Section II. PREVENTIVE MAINTENANCE

36. Responsibility

Preventive maintenance services are a function of the using organization. These services consist generally of before, during, and afteroperation services performed by the operator.

37. Cleaning

The complex nature of the sole stitching machine and the large number of its moving parts mean that the operation of a dirty machine will cause much more damage than ordinary wear. The machine must be kept free of all dirt, grit, and accumulation of hard wax. Procedures in a through d below will be performed after op-

eration and before periodic lubrication under normal conditions. Power must always be turned off before cleaning. Heat control may be turned to LOW for periodic cleaning during operation.

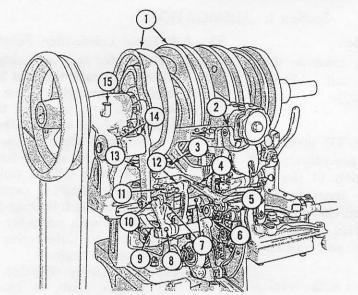
- a. Bobbin, Bobbin Case, and Shuttle. Refer to figure 13, and proceed as follows:
 - (1) Release bobbin case guide arm (2) by turning guide arm lever to left.
 - (2) Remove bobbin case (3) with bobbin.
 - (3) Remove bobbin from bobbin case and remove any thread on bobbin.
 - (4) Remove 3 shuttle ring screws (1)

LUBRICATION CHART

SOLE STITCHING MACHINE (LANDIS MODEL 12K) HEAD ASSEMBLY

Intervals given are maximums for normal operation. For abnormal conditions or activities, intervals should be shortened to compensate. Extend when not in use.

Clean all parts with Solvent, dry-cleaning (SD). Dry before lubricating. For intervals and lubricants refer to KEY.



- 9 Takeup Lever
- 10 Takeup Lever Connector Stud
- 11 Thread Lock Rocker Shaft Swivel Connector
- 12 Thread Lock Rocker Shaft Swivel and Thread Lock Toggle Lever Stud
- 13 Thread Lock Cam Lever Pivot Stud
- 14 Takeup Cam Lever Pivot Stud
- 15 Camshaft

REAR VIEW

1 Cam Lever Shaft

LEFT FRONT VIEW

No. 1 and No. 2 Cams (See Note 1)

Guide Arm Pivot Stud

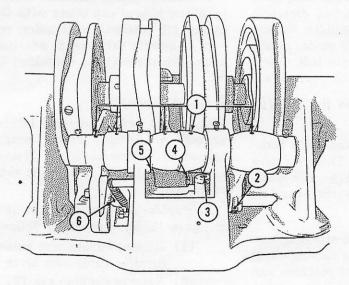
Thread Lock Rocker Shaft

8 Takeup Lever Stud

Shuttle Head Stud

4 Looper Bar Guide 5 Auxiliary Takeup Lever 6 Thread Lock Lever and Bushing

- 2 Thread Lock Rocker Shaft Swivel Connector Stud
- 3 Looper Side Motion Cam Lever Pivot Stud



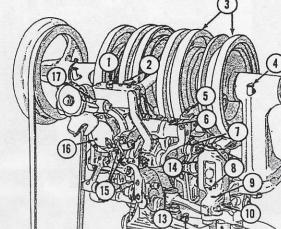
- 4 Looper Cam Lever Slide Block
- 5 Looper Forward Motion Cam Lever Pivot Stud
- 6 Presserfoot Cam Lever Eccentric

3B-1-11

Figure 11. Lubrication chart, head assembly.

LUBRICATION CHART

SOLE STITCHING MACHINE (LANDIS MODEL 12K) HEAD ASSEMBLY



- 9 Feed Adjusting Lever Slide Block
- 10 Feed and Guide Handle Retaining Plate
- 11 Feed Ratchet Rod Stud
- 12 Feed Slide
- 13 Thread Measure Slide Block Pivot Stud
- 14 Thread Measure Adjusting Slide
- 15 Needle Guide, Needle Segment (See Note 3)
- 16 Bobbin Case (See Note 2)
- 17 Guide Arm Pivot Stud

3 No. 2 and No. 3 Cams (See Note 3) 4 Camshaft

RIGHT FRONT VIEW

1 Shuttle Case (See Note 2)

5 Thread Lifter Slide Block 6 Thread Lifter Pivot Stud

Shuttle Driver and Awl Segment

- 7 Thread Measure Adjusting Bracket Eccentric
- 8 Feed Cam Lever Pivot Stud

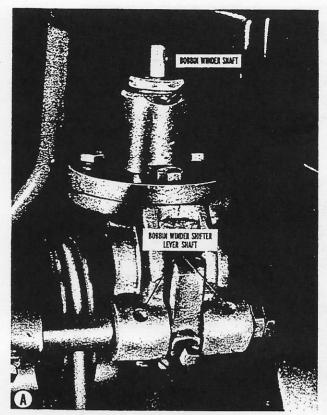
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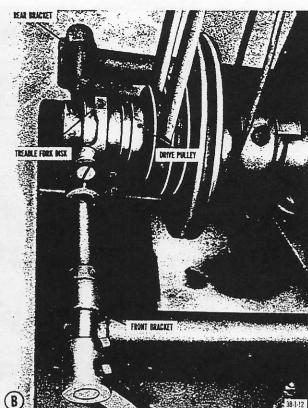
LUBRICANT	ALL TEMPERATURES	INTERVALS
OE—Lubricating Oil, Internal Combustion Engine	OE-50	Every 4 hours

NOTES:

- 1. CAMS—Clean cam races if gritty. Lubricate by applying 0E-50 with soft brush.
- SHUTTLE CASE—Each time bobbin is refilled and bobbin case replaced, fill shuttle case oilcup and add a few drops of oil to face of shuttle. Twice daily remove shuttle ring and clean ring and shuttle. Reassemble and lubricate.
- 3. NEEDLE GUIDE, NEEDLE SEGMENT AND AWL SEGMENT—Each time bobbin is replaced lubricate these parts with a few drops of oil.
- MOVING PARTS—In addition to points noted on chart all other moving parts should be lubricated twice daily with OE-50.

38-1-148





A-Bobbin winder

B-Drive pulley, front and rear brackets, and fork disk

Figure 12. Additional lubrication points.

from shuttle ring (4) and remove ring.

- (5) Remove shuttle (5).
- (6) Clean all parts thoroughly with SD, making sure that all wax is removed.
- (7) Clean shuttle case (18).
- (8) Rewind bobbin and lubricate (par. 35).
- (9) Replace parts by reversing procedure in (1) through (5) above.
- b. Thread Tension Assembly. Refer to figure 13, and proceed as follows:
 - (1) Remove adjusting disk lock disk (17).
 - (2) Remove tension spring adjusting disk (5).
 - (3) Remove tension spring (14) by sliding it off thread tension stud (16).
 - (4) Remove tension release collar (13) by sliding it off stud.
 - (5) Loosen stud in tension release yoke (12) until it is free of stud hole in stitcher head base. Remove release

- yoke; do not remove guide screws from yoke.
- (6) Remove tension spring friction disk (11) and tension wheel outside felt washer.
- (7) Slide tension wheel (10) off stud.
- (8) Clean all parts removed (except felt washer) with SD and brush. Make sure that tension wheel is completely free of wax.
- (9) Dry all parts and replace by reversing procedure in (1) through (7) above, making sure that when the tension spring adjusting disk and lock disk are replaced, only one thread of tension stud is exposed as shown in figure 13.
- c. Thread Rolls. Refer to figure 13, and use brush and SD to clean auxiliary takeup lever thread roll (6), thread measure thread roll (7), thread lock thread roll (8), and takeup lever thread roll (9). Make sure that all wax is removed from these thread rolls.

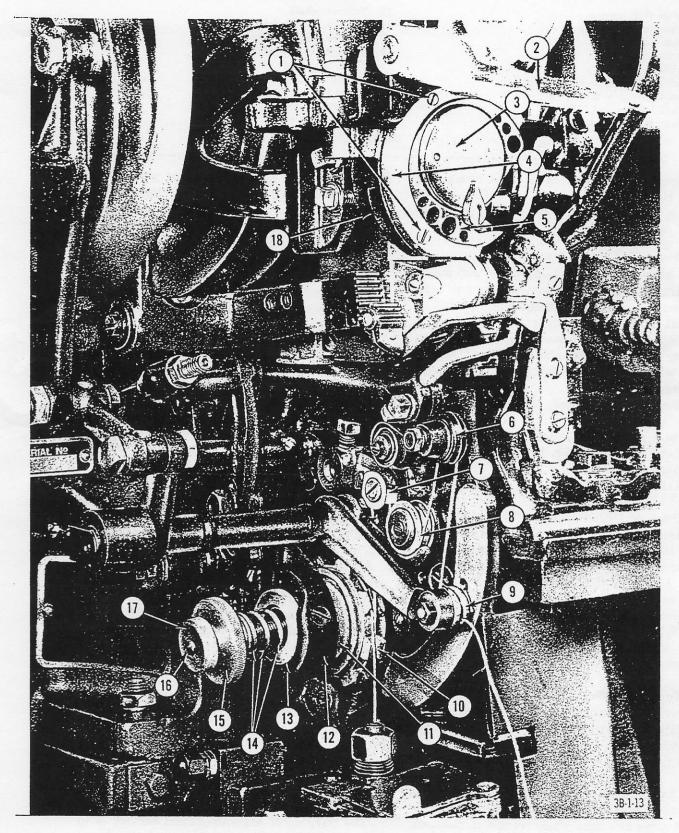


Figure 13. Points for cleaning.

- 1 Shuttle ring screws
- 2 Bobbin case guide arm
- 3 Bobbin case
- 4 Shuttle ring
- 5 Shuttle
- 6 Auxiliary takeup lever thread roll
- 7 Thread measure thread roll
- 8 Thread lock thread roll
- 9 Takeup lever thread roll

- 10 Tension wheel
- 11 Tension spring friction disk
- 12 Tension release yoke
- 13 Tension release collar
- 14 Tension spring
- 15 Tension spring adjusting disk
- 16 Thread tension stud
- 17 Adjusting disk lock disk
- 18 Shuttle case

Figure 13-Continued.

d. Overall Head Assembly. Use brush and SD to clean thoroughly all exposed parts of head assembly, including cam races and surfaces. Wipe with dry rag.

38. Before-Operation Service

The purpose of before-operation service is to determine that the equipment has not been damaged or tampered with since last operation and that it is in proper operating condition.

- a. Turn on heat 30 minutes before operation—longer if unusually cold weather—so that machine will warm up during inspection and servicing.
- b. Check for damaged, missing, and loose parts.
 - c. See that machine is properly cleaned.
- d. Examine cams, cam races, and all other functional parts.
- e. Make sure that wiring is in good condition.
- f. Check condition of wax. Wax pot should be at least half full. Wax should be clean and yellow in color. Fill wax pot if necessary, adding hard wax until melted wax reaches proper level. Clean pot if necessary and refill. Make sure wax is melted enough before starting operation.
- g. Check tension of needle and bobbin thread. When wax is hot, thread should pull easily, without binding, through thread handling parts. Adjust if necessary.
- h. Turn handwheel and check to see if needle and awl are tracking properly, and that needle, awl, lifter, and looper are adjusted for proper classes.
- i. Start motor. Check clutch treadle and clutch. Step on treadle; clutch should engage smoothly and speed of machine should increase until treadle is all the way down. Machine should come to a stop when treadle is released.
 - j. Check presserfoot release treadle action.

Step on treadle; this should raise presserfoot, release thread tension, and lower thread lock.

- k. Lubricate machine (pars. 34 and 35).
- l. Inspect stitcher and bobbin winder drive belts for good condition and correct tension. Replace or adjust as necessary (par. 60).
 - m. Check bobbin winder action.
- n. Rewind bobbin and make sure that stripper is supplying proper amount of wax for correct lubrication of thread.
- o. Test shoe for proper placement of stitch and make sure presserfoot holds properly.
 - p. Report any unsatisfactory conditions.

39. During-Operation Service

The purpose of during-operation service is to reduce the extent of damage if trouble should occur and to keep the machine operating properly.

- a. Listen for unusual noises and conditions during operation. If necessary to inspect closely, turn off motor and locate trouble by turning handwheel and observing operation of machine.
- b. Check tracking of needle and awl in operation. The path of the needle should exactly enter hole made by awl.
- c. Check occasionally to see that lifter and looper are holding their proper adjustments.
 - d. Check awl for burrs.
- e. Make adjustments or replacements as necessary.
- f. Oil needle segment, awl segment, needle guide, and shuttle when rewinding bobbin.
- g. Add wax to wax pot as necessary; do not completely fill wax pot.
- h. Clean and lubricate machine every 4 hours; turn heat to LOW while cleaning.

40. After-Operation Service

The purpose of after-operation service is to detect and correct deficiencies which developed

during operation, and to prepare machine for next operation.

- a. Turn off motor and heat.
- b. Check condition of wax. Clean out wax pot if necessary. Do not add wax; it is better to add new wax when the machine is hot during before-operation service.
- c. Clean machine thoroughly and wipe down with dry cloth.
 - d. Lubricate all necessary points.
- e. Do not rewind bobbin during after-operation service; wax will harden and thread will become brittle.
- f. Correct any deficiencies within the scope of organizational maintenance.

- g. Inspect head thoroughly for parts to be replaced or adjustments to be made.
- h. Check cam and cam lever shaft setscrews, and retaining screws of needle clamp, awl clamp, needle guide, lifter, and looper.
- i. Inspect belts for good condition and correct tension.
- j. Inspect wiring to see that it is securely fastened, clean, and undamaged.
- k. Check action of presserfoot treadle and clutch treadle.
- l. Correct any deficiencies within the scope or organizational maintenance.
- m. Report any unsatisfactory condition which cannot be corrected.

Section III. TROUBLESHOOTING

Trouble

41. General

Troubleshooting information is designed to help organizational personnel quickly locate and correct any troubles that develop during operation.

42. Precautions

When trouble occurs, shut off motor before searching for cause of trouble and making corrections. If motor is left running, accidental pressure on clutch treadle may engage machine enough to injure personnel.

43. Troubleshooting Chart

Some of the more common troubles that may develop in the stitching machine, their possible causes, and suggested remedies are listed in table I.

Table I. Troubleshooting Chart, Sole Stitching Machine

Trouble	Cause	Remedy
Broken needles.	Awl is bent or burned, causing needle to punch own hole.	
	Needle and a w l too small for thickness of work.	Use proper size needle and awl (par. 29d).
	needle.	Replace with awl of correct size.
	Awl and needle out of alinement:	
	Needle loose, awl loose.	Tighten clamp screws, adjust needle and awl.
	Worn needle guide Using wrong thread	Replace needle guide. Replace with proper

Table I-Continued

Remedy

Cause

	needle, barb of needle is pulled off as it passes through	
	sole. Forcing or twisting shoe while stitching.	machine, merely guide work, holding
	Improper preparation of shoe: welt not properly pressed to	
	outsole for cement to hold, sole not tem- pered by soaking in water, nails in shank	
	in path of stitches, old stitches in welts not removed, out- soles and inserts im-	
	properly shaped. Presserfoot not holding, causing shoe to twist.	Adjust presserfoot.
	Shoe guide too far for- ward, covering open- ing in needle plate.	proper placement of shifter handle.
Broken thread	Thread too large for needle (if needle does not break, barb cuts into thread).	Replace with proper size thread.
	Bobbin wound too tight or too full.	Rewind bobbin.
	Needle set too close to	inch below needle

Table		Table I-Continued		
Car	Trouble	Remedy	Cause	Trouble
Cam lever spring br Thread 1 o ment m takeup 1 wrong po	est dest	Adjust looper to loop	catches edge of thread.	
Thread lif	Thread will not loop on shuttle.	for proper tension.	Auxiliary takeup does not hold thread taut when looper is to car- ry thread around needle.	
Insufficient time.	Cold machine.	Check all parts and re- move burrs or re- place parts.	dling parts.	
Heat contr	Machine will	Adjust guide arm.	Bobbin case guide arm against case.	
enough.	not heat properly.		Wax in poor condition, making thread brit-	
Heat plat properly. Wiring bro			tle. Cold machine, gummy wax increases thread tension to breaking	
	Machine does not turn over at proper speed.	Make proper adjust- ment so thread pulls easily without bind- ing.	point.	
	Bobbin winder will not turn.	Adjust thread lock lever to open 1/16 inch below thread lock roll.	Thread lock will not open.	
Presserfoot justment	Presser foot treadle diffi- cult to press	Remove shuttle and thread, and rethread as necessary.	Frayed thread behind shuttle.	Machine lock
Guide arm	down. Bobbin case loose.	Needle too close to guide, adjust to 1/16 inch below.	Thread binds between needle and needle guide.	
	Bobbin case sticks.	Adjust thread lock lev- er.		
Shuttle 'ar case need tion.		Clean thread handling parts, adjust wax pot stripper or replace rubber stripper. Re-	Wax accumulated on thread.	

Trouble	Cause	Remedy
	takeup lever in	lon. Make adjustment with lever in lowest posi
not loop	wrong position. Thread lifter out of line. Needle too far below needle guide.	
Cold machine.	Insufficient warmup time.	
Machine will notheat properly.	Heat plates not set properly.	HIGH during oper ation.
n o t turn o v e r a t proper speed.	Clutch pedal slips Clutch out of adjustment. Loose or worn belt Tire on driven pulley worn to prevent contact with idler pulley.	Tighten setscrews or pedal. Adjust for proper action. Tighten or replace belt
Presser foot treadle diffi- cult to press down.	Presserfoot out of ad-	Adjust presserfoot.
Bobbin case loose. Bobbin case sticks.	Guide arm too far from case. Guide arm pressing against case. Shuttle 'and shuttle case need lubrication.	1/32 inch from case Adjust arm so it i 1/32 inch from case Lubricate shuttle and

Section IV. OPERATOR MAINTENANCE

44. Responsibility

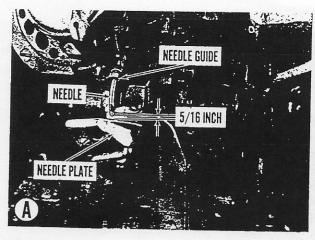
a. Replacements and adjustments in paragraphs 45 through 55 are the responsibility of the operator and will be performed as necessary. Services and repairs beyond those indicated should not be attempted by the operator but should be referred for higher echelon maintenance.

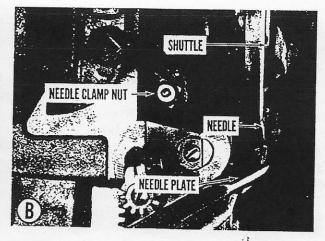
b. Services in paragraphs 45 through 55 will also be made by field and depot mechanics when

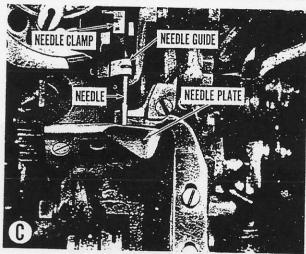
the stitcher head is assembled after complete disassembly (par. 65).

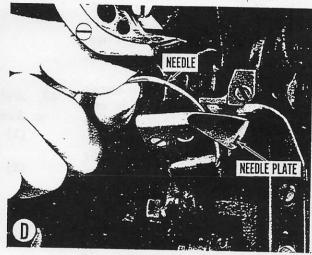
45. Needle Replacement and Adjustment

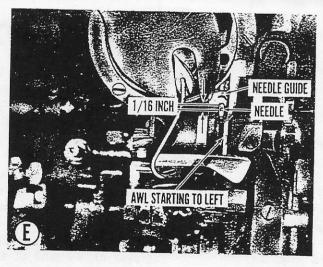
- a. Removal. Refer to figure 14, and proceed as follows:
 - (1) Turn handwheel forward so that needle is moving up while awl is down.
 - (2) When needle is approximately 5/16 inch above needle plate (A), needle clamp nut can be reached through











3B-1-14

-Needle 5/16 inch above needle plate -Needle clamp nut -Needle in clamp and needle guide

D—Removing needle from needle plate E—Needle 1/16 inch below needle guide

Figure 14. Needle removal, installation, and adjustment.

opening between shuttle case and shuttle head (B). If needle has been broken, this setting cannot be used; turn handwheel until needle clamp nut can be seen.

- (3) Use needle and awl clamp nut wrench to loosen clamp nut 1 complete turn.
- (4) Pull needle down through needle plate until it comes out of clamp and needle guide (C).
- (5) Give needle one-half turn to left and pull needle up and out of needle plate (D).
- b. Installation. Refer to figure 14, and proceed as follows:
 - (1) Insert new needle down through needle plate while needle is turned to left (D).
 - (2) Turn needle to right, bringing shank of needle in line with needle guide, and push needle through guide into clamp (C).
 - (3) When needle is 5/16 inch above needle plate, tighten clamp nut enough to hold needle while adjustment (c below) is made.

c. Adjustment.

- (1) Turn handwheel forward until awl starts to feed (moves) to left. At this point, barb of needle should be 1/16 inch from needle guide (E, fig. 14).
- (2) If needle is not in correct position, line up needle clamp nut (a above) and loosen and set needle properly.
- (3) Tighten clamp nut securely.

46. Needle Guide Replacement and Adjustment

a. Removal.

- (1) Remove needle (par. 45a).
- (2) Use needle guide socket wrench to loosen needle guide driving segment binding screw.
- (3) Pull needle guide forward (fig. 15) to reach needle guide retaining screw.
- (4) Remove needle guide retaining screw, then remove needle guide by pushing guide to right, off dowel pins in needle guide arm.

b. Installation.

- (1) Install needle guide by setting it on dowel pins in needle guide arm.
- (2) Use needle guide socket wrench to replace needle guide retaining screw.

c. Adjustment.

- (1) Bring needle segment to its most forward position by turning handwheel to rear.
- (2) Push needle guide back against needle segment so that guide touches segment but does not bind.
- (3) Tighten needle guide driving segment binding screw.
- (4) Check adjustment by turning handwheel slowly. If machine binds, needle guide is too close. Loosen binding screw and adjust for proper operation.

47. Awl Replacement and Adjustment

a. Removal.

- (1) Move shoe guide down to right to reach awl clamp nut (A, fig. 16).
- (2) Loosen latch pin screw thumb nut (A) and push nut to rear; this will remove latch pin from shoe guide and allow shoe guide to be moved.
- (3) Turn handwheel toward rear until awl is in its highest position (E, fig. 14).
- (4) Use needle and awl clamp wrench to loosen awl clamp nut one complete turn.
- (5) Hold point of awl with left hand and turn handwheel forward; this will move clamp to rear, releasing awl.
- (6) Give awl one-half turn to right, and pass awl down through needle plate.

b. Installation.

- (1) Insert new awl up through needle plate while awl is turned to right; give awl one-half turn to bring in line with awl clamp.
- (2) Hold point of awl, and turn handwheel to rear until shank of awl enters awl clamp. When shank can be felt just protruding from lower end of clamp, tighten clamp nut enough to hold awl during adjustment (c below).
- (3) After adjustment, replace shoe guide as follows:

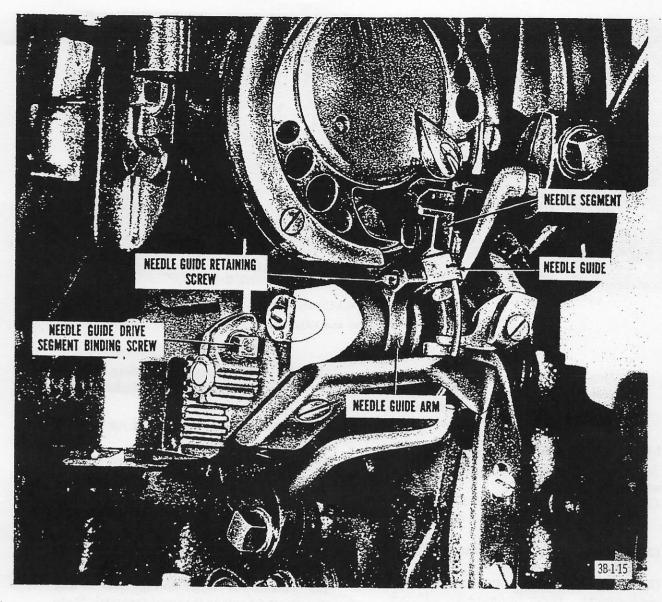
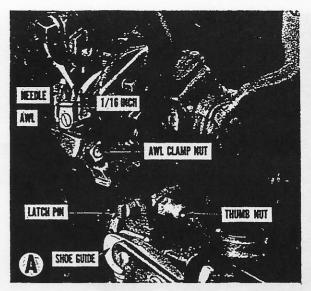
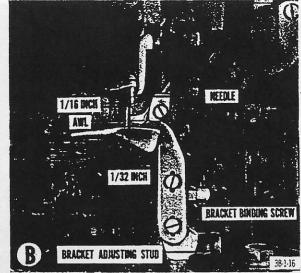


Figure 15. Needle guide removal.

- (a) Push thumb nut (A, fig. 16) to rear.
- (b) Push shoe guide back into position.
- (c) Release thumb nut slowly until latch pin fits into slot in rear of shoe guide.
- (d) Tighten thumb nut.
- c. Adjustment.
 - Turn handwheel to rear until awl is in its highest position. At this point, awl should be 1/16 inch below point of needle and 1/32 inch to left of needle (B, fig. 16); if not, adjust as in (2) or (3) below.
- (2) Adjust for 1/16 inch between awl and point of needle as follows:
 - (a) Loosen awl clamp nut to move awl up or down until proper separation is obtained.
 - (b) Tighten clamp nut securely.
- (3) Adjust for awl 1/32 inch to left of needle as follows:
 - (a) With awl in its highest position, loosen feed adjusting lever bracket binding screw (B, fig. 16).
 - (b) Turn feed adjusting lever bracket adjusting stud (B, fig. 16) clock-





A-Removal

B-Adjustment

Figure 16. Awl removal and adjustment.

wise to move awl to right; counterclockwise, to left.

(c) When adjustment is correct, tighten feed bracket binding screw.

48. Lifter Replacement and Adjustment

- a. Replacement. Refer to figure 17, and proceed as follows:
 - Use lifter-looper binding screw wrench to loosen lifter binding screw (A).
 - (2) Slide lifter out of eccentric stud in lifter lever.
- (3) Insert new lifter into eccentric stud. b. Adjustment. Refer to figure 17, and proceed as follows:
 - Move lifter to left or right to center on needle (A) and pass as close as possible. Adjust by loosening binding screw and turning eccentric stud (A) until lifter clears needle.
 - (2) Adjust lifter forward or backward to clear shuttle by 1/32 inch (B).
 - (3) Tighten binding screw.
 - (4) Turn machine slowly with handwheel to check for correct lifter clearances and position.

49. Looper Replacement and Adjustment

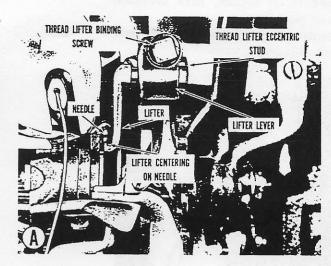
a. Replacement. Refer to figure 18, and proceed as follows:

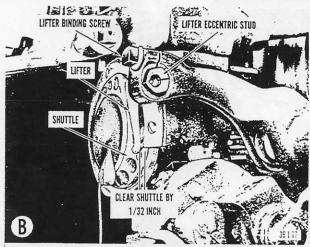
- Use lifter-looper binding screw wrench to loosen looper binding screw (A).
- (2) Remove looper by pulling up and out of looper bar.
- (3) Insert new looper into looper bar.
- b. Adjustment. Refer to figure 18, and proceed as follows:
 - (1) Move looper in or out of looper bar, or turn looper as necessary to set looper 1/16 inch above barb of needle (A).
 - (2) Do not set looper so high that it hits thread hook as it comes forward; there should be 1/32 inch between looper and thread hook (B).
 - (3) Tighten looper binding screw.

50. Thread Measure Adjustment

The thread measure mechanism measures the thread required to form the stitch and controls depth of thread lock in the sole. When properly adjusted, the lockstitch should be in the center of the outer sole (A, fig. 19). If stitch is not holding and examination shows lock is out of place, refer to B, figure 19, and adjust as follows:

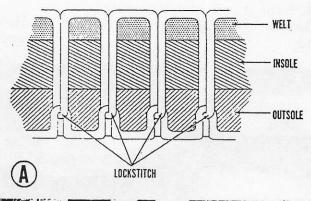
a. Loosen thread measure eccentric binding screw.

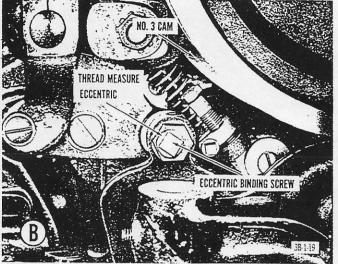




A—Lifter centering on needle B—Lifter clearing shuttle by 1/32 inch

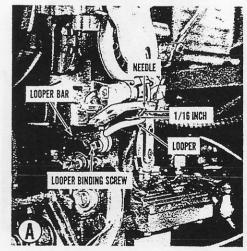
Figure 17. Lifter replacement and adjustment.





A—Position of thread lockstitch in sole
B—Thread measure eccentric in neutral position

Figure 19. Thread measure adjustment.



A-Looper 1/16 inch above barb of needle



B-Looper 1/32 inch below thread hook

Figure 18. Looper replacement and adjustment.

- b. When narrowest side of hexagon head on eccentric is to front, it is in neutral position.
 - (1) If lock is on top, turn eccentric forward.
- (2) If lock is on bottom, turn eccentric toward rear.
- c. Hold eccentric in properly adjusted position, and tighten binding screw.

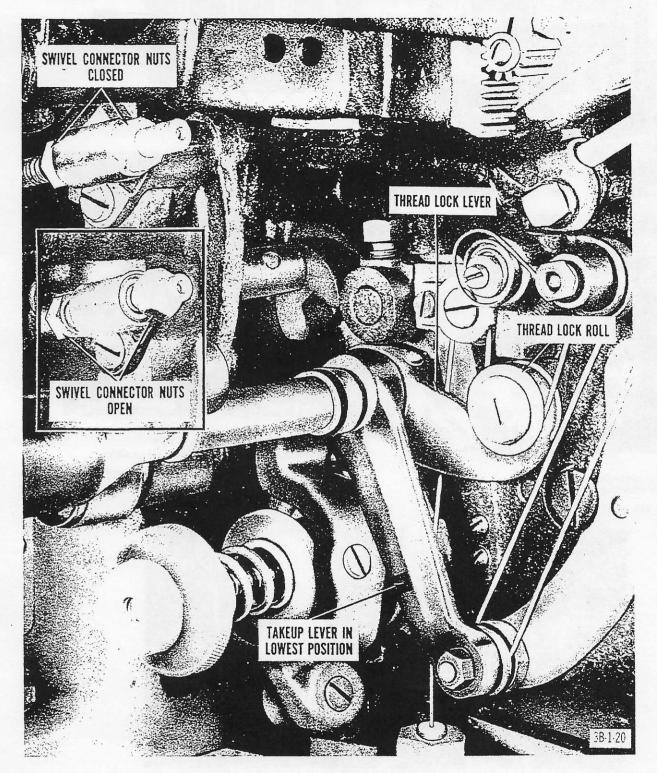


Figure 20. Thread lock adjustment.

51. Thread Lock Adjustment

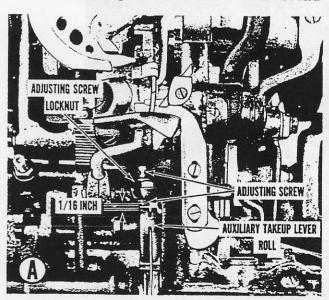
The thread lock holds the feeding thread while the takeup lever is pulling the lockstitch down into the sole of the shoe. When the takeup lever starts to move upward, the thread lock lever should lower about 1/32 inch to let the thread through. If the lock will not hold or will not release on time, refer to figure 20, and adjust as follows:

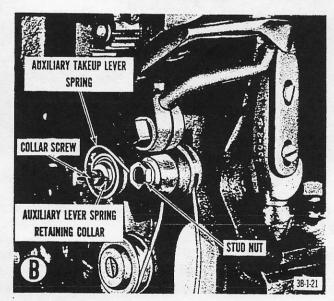
- a. Turn handwheel to rear until takeup lever is in its lowest position.
- b. Relieve thread tension by loosening thread tension lock disk and adjusting disk.
- c. Loosen swivel connector nuts until thread can be pulled freely through machine.
- d. To increase pressure, tighten rear swivel connector nut.
- e. To decrease pressure, loosen rear nut and tighten front nut.
 - f. Check for binding.
- g. Retighten tension adjusting disk and lock disk until only 1 thread of stud shows.
- h. Pull on thread; thread should not slip when takeup lever is in lowest position.

52. Auxiliary Takeup Lever and Spring Adjust-

- a. Takeup Lever.
 - (1) The auxiliary takeup lever takes up the slack thread and holds it taut as the looper carries the thread around

- the needle. At this point, there should be 1/16 inch clearance between adjusting screw and auxiliary lever roll.
- (2) Refer to A, figure 21, and adjust as follows:
 - (a) Make sure looper is in front of needle.
 - (b) Loosen auxiliary takeup adjusting screw locknut.
 - (c) Turn auxiliary takeup adjusting screw to right or left as required for proper adjustment.
 - (d) Tighten locknut.
- b. Auxiliary Takeup Lever Spring. The auxiliary takeup lever spring pulls the lever against the adjusting screw when the looper is not in front of the needle. If the spring is too slack, refer to B, figure 21, and adjust as follows:
 - Remove stud nut from auxiliary takeup thread roll stud.
 - (2) Loosen auxiliary takeup lever spring retaining collar by turning collar screw.
 - (3) Turn coiled end of spring toward rear; not too tight, or lever will not move.
 - (4) Tighten collar screw and replace thread roll stud nut.





A-Lever adjustment

B-Lever spring adjustment

Figure 21. Auxiliary takeup lever and spring adjustment.

53. Presserfoot Adjustment

The presserfoot holds the sole of the shoe to the needle plate during operation. The presserfoot is properly adjusted when it cannot be raised by the hand lever unless the awl is in its highest position or feeding to the left. Refer to figure 22, and adjust presserfoot as follows:

a. Bring needle segment to its most forward position.

- d. Tighten adjusting screw lock screw.
- e. Check by stepping on presserfoot treadle.

54. Presserfoot Channel Knife Adjustment

The presserfoot channel knife cuts a channel for the thread in a leather sole. The channel knife is used only in stitching a leather sole with a short stitch. Always set the machine for a short stitch (par. 22) before setting knife; raise knife when using long stitches to prevent

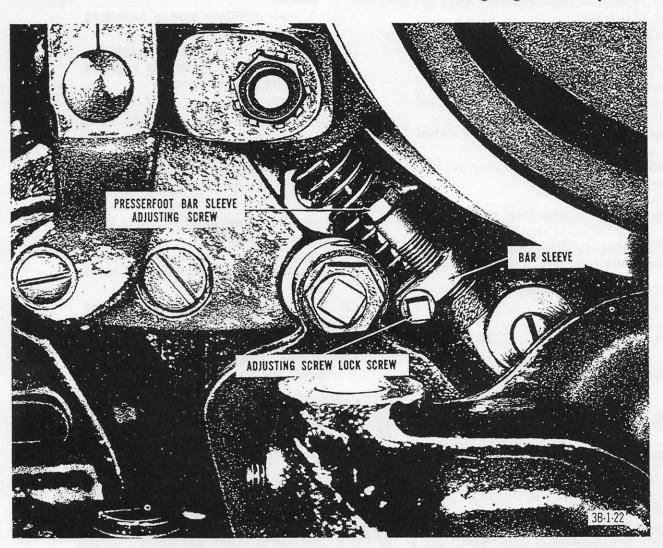
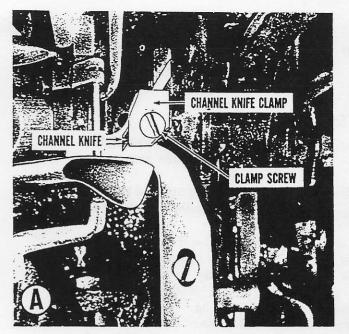
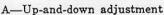


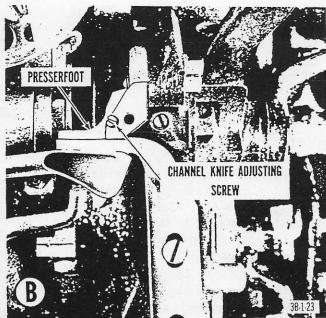
Figure 22. Presserfoot adjustment.

- b. Loosen presserfoot bar sleeve adjusting screw lock screw.
- c. To increase pressure, loosen adjusting screw; to decrease pressure, tighten adjusting screw. Do not overtighten or machine will lock.

knife or awl breakage. For short stitch use, the knife must be set so that the channel will be the same distance from the edge of the sole as the stitching, and so that it will cut a channel deep enough for the stitches to lay beneath the surface of the sole. Refer to figure 23, and adjust presserfoot channel knife as follows:







B-In-and-out adjustment

Figure 23. Presserfoot channel knife adjustment.

- a. Loosen clamp screw (A) and raise or lower channel knife as required. When knife is lowered, it should come 1/32 to 1/16 inch below clamp.
- b. Change distance of channel from edge of sole as follows:
 - (1) Remove clamp screw, channel knife, and clamp (A).
 - (2) Turn adjusting screw (B) in to move channel closer to edge of sole; turn out to move channel away from edge of sole.
 - (3) Replace clamp and screw.
 - (4) Insert and adjust channel knife.

55. Wax Pot Stripper Replacement and Adjustment

Wax pot strippers regulate the amount of wax on the thread. Strippers should be adjusted so that the thread will pull through the stripper easily and emerge with only enough wax to keep the thread flexible. Strippers must be replaced when they can no longer be adjusted to strip the wax properly.

a. Replacement.

- (1) Use stripper nut wrench to remove binding nut (fig. 24).
- (2) Slide stripper stud off of bobbin or needle thread.

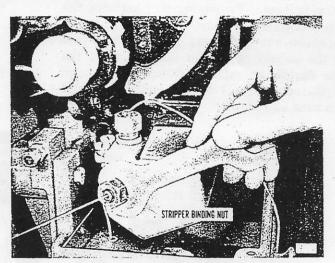


Figure 24. Adjusting wax pot stripper.

- (3) Remove rubber stripper from stripper screw, and slide stripper off thread.
- (4) Place thread through new rubber stripper and install stripper in stripper screw.
- (5) Thread stripper stud and binding nut.
- (6) Fit stripper stud over stripper and screw binding nut on stripper screw.

b. Adjustment.

(1) Use stripper nut wrench to tighten binding nut 1 or 2 turns (fig. 24).

- (2) Pull thread through stripper. Thread should have enough wax to make it flexible but not enough to drip from thread.
- (3) If too much wax is apparent, tighten
- binding nut until proper amount of wax is on thread.
- (4) Do not overtighten binding nut or tension will break thread.

Section V. UNIT MAINTENANCE

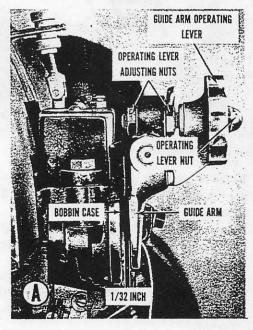
56. Responsibility

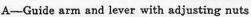
- a. Adjustments in paragraphs 57 through 60 are the responsibility of the unit mechanic, who may also perform adjustments assigned to the operator (pars. 45-55). Services and repairs beyond those detailed to the operator or unit mechanic should be reported for referral to higher echelon maintenance.
- b. Adjustments covered in paragraphs 45 through 60 will also be made by field and depot mechanics when the machine is assembled after complete disassembly.

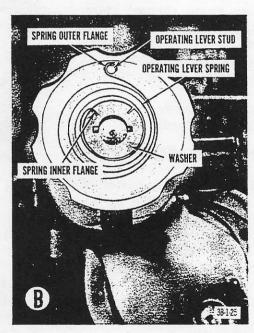
57. Bobbin Case Guide Arm Adjustments

a. Guide Arm. Proper spacing between the bobbin case guide arm and bobbin case (A, fig. 25) provides correct thread clearance and prevents the bobbin case from falling out of the shuttle during operation. Adjust guide arm for 1/32-inch space between guide arm and bobbin case as follows:

- (1) Loosen front adjusting nut and tighten rear nut to move guide arm away from bobbin case.
- (2) Loosen rear adjusting nut and tighten front nut to bring guide arm closer to bobbin case.
- b. Guide Arm Operating Lever Spring. The guide arm operating lever is kept in its holding position (A, fig. 25) by an operating lever spring (B). Constant use of the lever may cause slackening in the spring. Adjust spring for proper tension as follows:
 - (1) Remove operating lever nut (A) and spring retaining plate.
 - (2) Tighten spring (B) by removing flange on inside of spring from left slot in washer and placing in right slot.
 - (3) If procedure in (2) above does not tighten spring sufficiently, remove spring and reverse washer so slots







B-Guide arm operating lever spring

Figure 25. Bobbin case guide arm adjustments.

- are at bottom. Place hook on outside of spring on stud of operating lever, and put inside flange of spring in right hand slot of washer.
- (4) Replace spring retaining plate and operating lever nut.

58. Bobbin Winder Adjustment

The bobbin winder (fig. 26) is activated by an idler pulley making contact with a rubber tire on a driven pulley which turns the shaft. Use of the winder will eventually wear enough rubber from the driven pulley tire to decrease engagement of the pulleys and cause slippage. Refer to figure 26, and adjust bobbin winder as follows:

- a. Loosen shifter handle retaining screw one complete turn.
 - b. Engage shifter handle by pulling forward.
 - c. Loosen shifter handle shaft locknut.
- d. Tighten tension nut until idler pulley properly engages driven pulley to turn bobbin winder shaft.
 - e. Tighten shifter handle retaining screw.
 - f. Disengage handle and tighten locknut.

59. Clutch Adjustment

Refer to figure 27, and adjust stitcher clutch for proper engagement as follows:

- a. Loosen setscrews on stitcher drive pulley set collar.
- b. Move set collar in until there is a 3/16-inch clearance between stitcher drive pulley disk and bobbin winder pulley disk when clutch is not engaged.
- c. Tighten drive pulley setscrews and test clutch for proper engagement.

60. Belt Replacement and Adjustment

a. General. The two drive belts of the stitching machine are both turned by the drive shaft. One belt operates the head assembly; the other, the bobbin winder. The $\frac{1}{2}$ - by 98-inch, V-type head assembly (or stitcher drive) belt is attached to the handwheel and turns the camshaft. The 5/16- by $56\frac{1}{2}$ -inch, round, leather, bobbin winder drive belt is attached to the idler pulley which turns the bobbin winder shaft. These belts must be kept properly adjusted for efficient operation of the machine, and belts should be replaced when cut or frayed.

- b. Adjustment. When an old belt is being tightened or a new belt installed, observe procedures in (1) through (3) below. Check to assure that the stitcher drive pulley is in a straight line with the handwheel pulley as the stitcher head.
 - (1) Allow for normal stretch which will occur after a new leather belt has been run. This stretch usually amounts to \(\frac{1}{8}\) inch for each foot of belt length. For example, if the actual measured distance around the pulleys to be connected is 6 feet, cut a new leather belt \(\frac{3}{4}\) inch less than 6 feet.
 - (2) Cut ends of belt square.
 - (3) Points of hooks fastening ends of belt together should go to pulley side of belt. Flatten hook points so belt will not bump on pulley.

7 .

c. Removal.

- (1) Belts to be replaced may be cut at any point and be discarded.
- (2) Belts to be adjusted should be cut as close to hooks as possible, or hooks may be straightened and removed.

d. Installation.

- (1) Stitcher drive belt.
 - (a) Place belt around camshaft next to handwheel and around drive shaft.
 - (b) Hook ends of belt together.
 - (c) Place belt in groove of handwheel (B, fig. 1).
 - (d) Catch part of remaining slack of belt over edge of outer groove of stitcher drive pulley (fig. 27). Turn handwheel and press on belt until it works completely into stitcher drive wheel groove.

(2) Bobbin winder drive belt.

- (a) Place belt around shaft next to idler pulley (fig. 26) and in groove of bobbin winder pulley on drive shaft (fig. 27).
- (b) Hook ends of belt together.
- (c) Catch remaining slack of belt on edge of idler pulley. Turn pulley with one hand while gradually working belt over edge into groove.

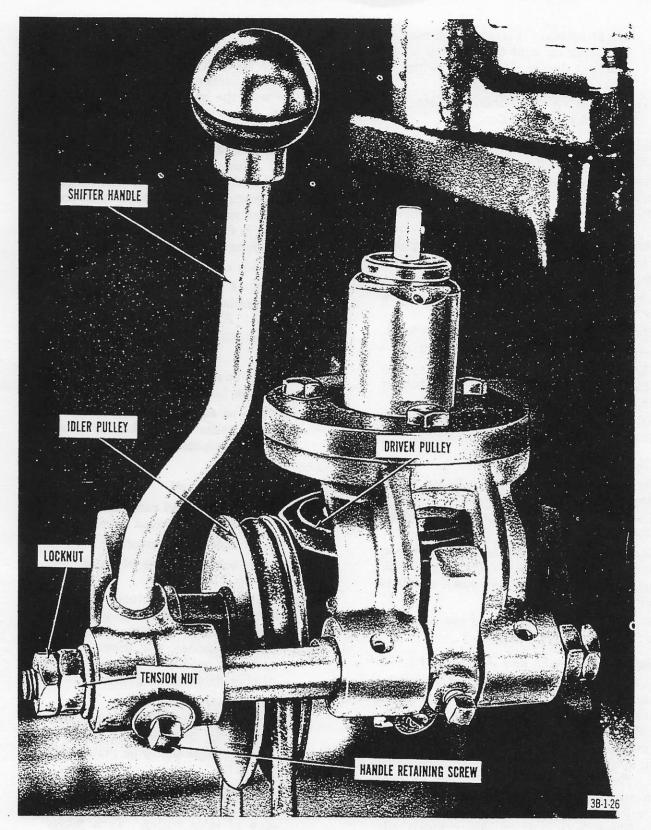
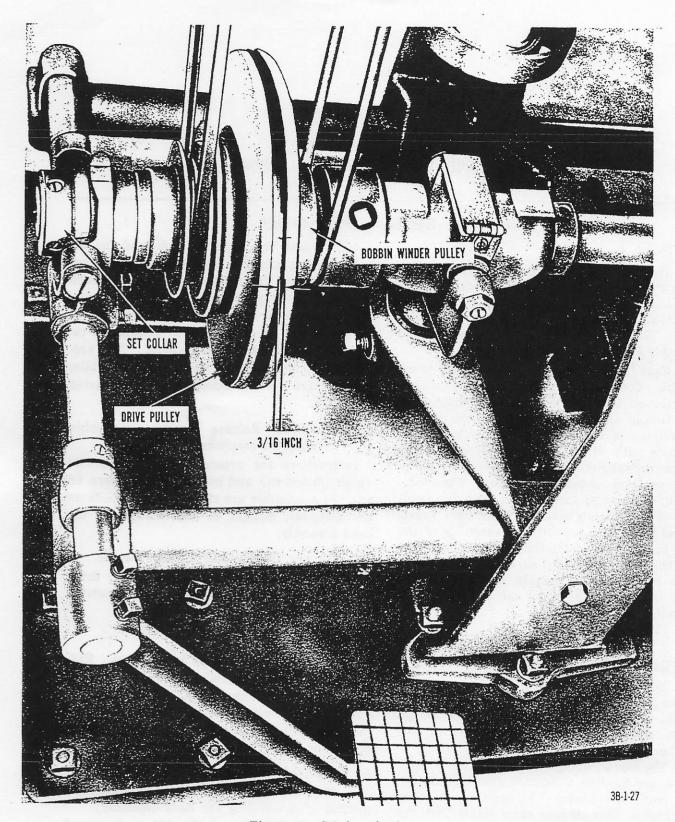


Figure 26. Bobbin winder.



1:

Figure 27. Stitcher clutch.

CHAPTER 4

FIELD AND DEPOT MAINTENANCE

Section I. GENERAL PROCEDURES

61. Head Assembly

- a. The close interlocking relationship of the many parts of the stitcher head makes it impossible to remove complete subassemblies without partial or total disassembly of other subassemblies. Therefore, for repair purposes the head assembly will be completely disassembled.
- b. Care in the disassembly of the head is essential. Coordination of working parts within the compact head assembly requires very accurate timing and fine adjustment, and proper functioning of the head depends primarily on the care with which the mechanic establishes the correct relationship between the parts as he replaces and assembles them. Therefore, step-by-step procedures-rather than disassembly-of the stitcher head are given here (pars. 64 and 65). Disassembly and assembly of the head are authorized for third and higher echelons only. Each bearing surface of all moving parts of the head assembly should be lubricated with a few drops of oil as the head is assembled.

c. Although the accuracy indicated for assembly is not essential in disassembly, it is recommended that the mechanic make a thorough study of assembly procedures. When the mechanic is familiar with assembly procedures, he should be able to effect such procedures in reverse order to disassemble the head. This procedure will keep parts of various subassemblies together and prevent confusion of parts during assembly.

62. Presserfoot Release Treadle and Bobbin Winder Assemblies

Instructions for presserfoot release treadle (pars. 66 and 67) and bobbin winder (pars. 68 and 69) assemblies are step-by-step procedures for assembly, similar to instructions for the head assembly.

63. Stitcher Clutch and Clutch Treadle

These units of the stitcher-finisher drive shaft are removed in accordance with instructions in paragraph 114.

Section II. HEAD ASSEMBLY

64. Description and Operation

- a. The head assembly includes four cams designed to control the motion of cam levers which, through connecting subassemblies, directly activate the functional parts of the stitcher head.
- b. The cams, numbered from the left 1, 2, 3, and 4, are fixed on a common camshaft driven by a power drive belt. The cams are keyed to the shaft so that all four cams rotate with the camshaft at the same speed. Each cam has a number of grooves (cam races) machined in the sides and rims—eccentric grooves in the

sides and irregular grooves in the rims. Riding in these races are rolls attached to the cam levers. As the cams rotate, they control the action of the cam levers and the sequence of operation through the movement of the cam lever rolls in the cam races.

65. Assembly Procedure

- a. Method. The following steps indicate the method of assembling the head assembly:
 - (1) Place frame (9, fig. 28) on frame of shoe repair machine and fasten with 2 locking screws (13).

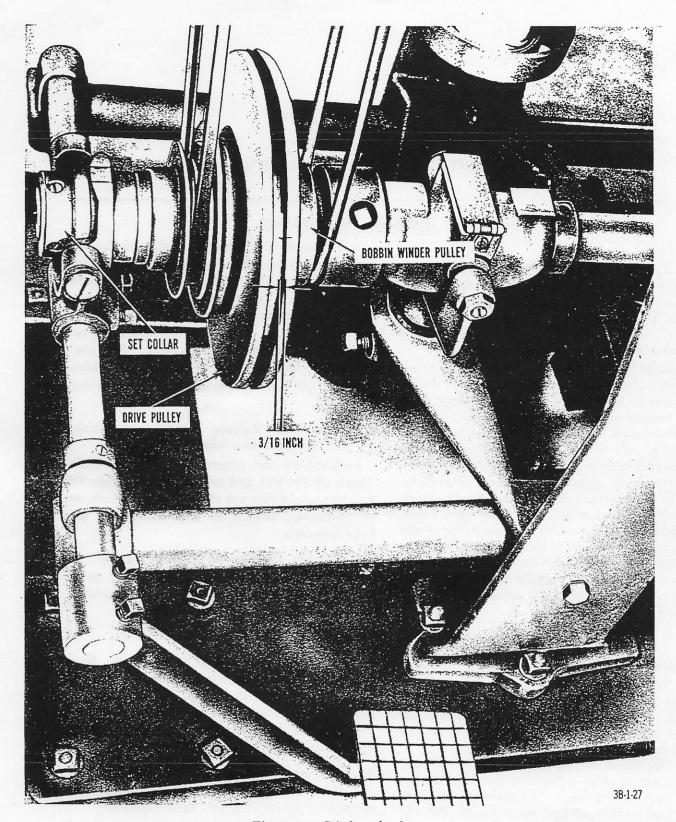
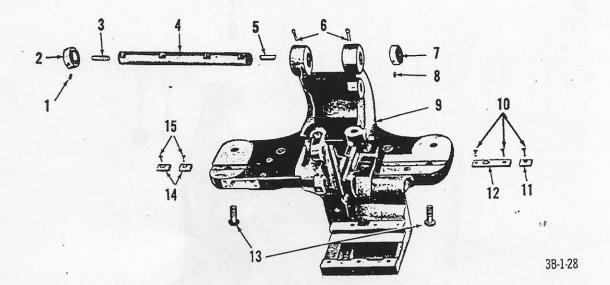


Figure 27. Stitcher clutch.



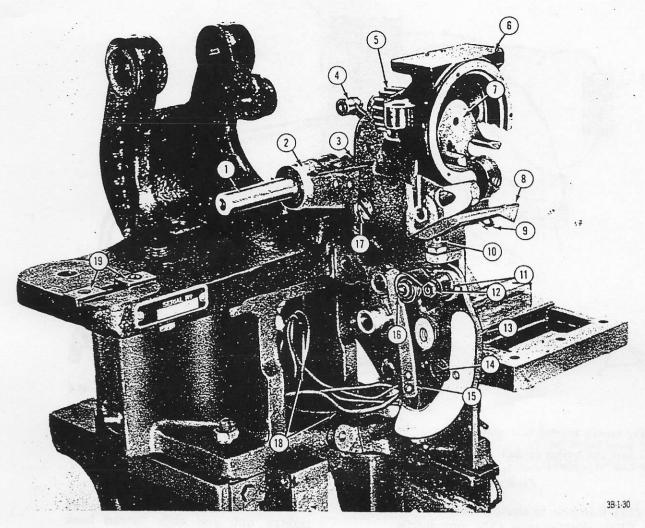
- Cam lever shaft left collar setscrew
- 2 Cam lever shaft left set collar
- Cam lever pivot stud
- 4 Cam lever shaft
- 5 Cam cover pivot stud
- 6 Cam lever shaft setscrews 7 Cam lever shaft right set collar
- 8 Cam lever shaft right collar setscrew

- 9 Frame
- 10 Camshaft right column seating key screws
- 11 Camshaft right column short seating key
- 12 Camshaft right column long seating key
- 13 Locking screws
- 14 Camshaft left column seating keys
- 15 Camshaft left column seating key screws

Figure 28. Stitcher frame, exploded view.

- (2) Fit camshaft right column long seating key (12) and camshaft right column short seating key (11) into key seats on frame, and fasten with camshaft right column seating key screws (10). Repeat procedure for 2 camshaft left column seating keys (14) and screws (15).
- (3) Place auxiliary takeup lever fulcrum stud (7, fig. 29) into auxiliary takeup bracket (11). Place fulcrum stud retaining washer (12) and stud nut (13) on fulcrum stud, and tighten nut.
- (4) Slide auxiliary takeup lever thread roll (6) on thread roll stud (8), and screw thread roll stud into auxiliary takeup lever assembly (5). Hook small curved end of auxiliary takeup lever spring (4) over thread roll stud with open end up, and install thread roll stud nut (3) on stud.
- (5) Place auxiliary takeup lever assembly on fulcrum stud with coiled end of spring centered on stud.

- (6) Place spring retaining collar (2) against spring, and place fulcrum stud retaining washer against spring retaining collar.
- (7) Insert spring retaining collar screw (1) through openings in washer, collar, and spring and into screw hole in fulcrum stud. Compress coiled end of spring slightly to eliminate slack, and tighten screw.
- (8) Place heat unit clamp (16) on auxiliary takeup bracket. Insert and tighten clamp screws (17).
- (9) Fit auxiliary takeup lever adjusting screw (9) in screw hole in auxiliary takeup bracket. Screw adjusting screwnut (10) on screw, and finger tighten nut.
- (10) Place bracket screw external tooth washer (14) on bracket screw (15), and attach auxiliary takeup bracket assembly (13, fig. 30) to frame (9, fig. 28) by inserting and tightening bracket screw (14, fig. 30).



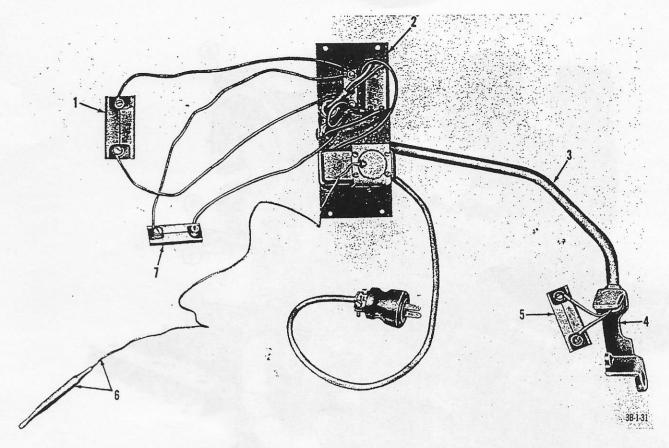
- Shuttle head stud
- Shuttle head
- Shuttle head stud nut
- Thread hook cam roll Shuttle driver pinion
- Shuttle case
- Shuttle driver
- Needle plate Thread hook
- Auxiliary takeup lever adjusting screw
- Auxiliary takeup lever assembly

- Auxiliary takeup lever thread roll stud nut
- Auxiliary takeup bracket assembly
- 14 Auxiliary takeup bracket screw
- 15 Heat unit clamp
- Auxiliary takeup lever spring
- Shuttle head screw 17
- Wiring from control panel to takeup bracket heat unit, wax pot heat unit, and heat control thermostat bulb
- 19 Camshaft left column seating keys

Figure 30. First stage in assembly of stitcher head.

clamp are aligned with holes in

- (15) Insert takeup heat unit clamp screws (3) through holes in clamp and into holes in bracket.
- (16) Place wax pot heat unit (8) on back of takeup bracket, and place free end of takeup bracket heat unit clamp over wax pot heat unit.
- (17) Tighten takeup bracket heat unit
- clamp screw, making certain clamp holds takeup bracket heat unit and wax pot unit securely against takeup bracket.
- (18) Tap shuttle head bushing (16, fig. 33) into shuttle head (3) until bushing is flush with rear of head.
- (19) Tap needle guide driving pinion bushing (9) into shuttle head.
- (20) Fit needle segment stud setscrew



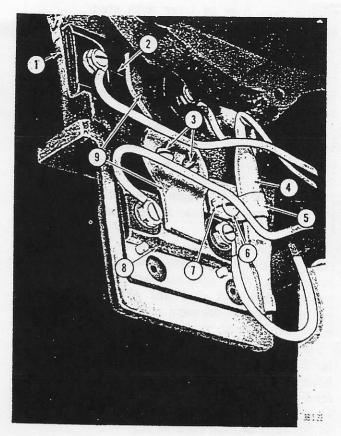
- 1 Auxiliary takeup bracket heat unit
- 2 Control panel assembly 3 Shuttle heat unit wiring conduit
- Shuttle heat unit wiring conduit
 Shuttle heat unit guard

- Shuttle heat unit
- 6 Thermostat bulb with tubing
- 7 Wax pot heat unit

Figure 31. Stitcher control panel and heat unit assembly.

- (17) into hole in shuttle head.
- (21) Slide shuttle case (15) on shuttle head bushing and push shuttle case until flush with shuttle head.
- (22) Aline holes in shuttle case with holes in shuttle head and insert and tighten 4 shuttle case-to-head screws (14).
- (23) Fasten needle plate (10) to bottom of shuttle head with needle plate retaining screw (13).
- (24) Slide needle plate adjusting eccentric (12) into opening in shuttle head. Fit adjusting eccentric retaining screw (11) into screw hole in shuttle head, locking eccentric in place. Tighten screw. (Some stitchers have an opening in the plate for a dowel screw and not for an eccentric; in such cases, eliminate this step.)
- (25) Place thread hook cam roll stud (5) in thread hook (6), screw thread hook

- cam roll stud nut (7) on stud and tighten nut, and slide thread hook cam roll (4) on cam roll stud. Place thread hook assembly into race in shuttle head and fasten thread hook race cap (8) on shuttle head, over thread hook assembly, with thread hook race cap retaining screws (2).
- (26) Place shuttle head assembly on machine (2, fig. 30). Tap shuttle head lightly to insure flush fitting.
- (27) Fit shuttle head screw (1, fig. 33), through opening in shuttle head and into hole in frame (17, fig. 30). Tighten screw firmly.
- (28) Insert shuttle head stud (1) through openings in shuttle head and stitcher frame. Place stud nut (3) on end of stud and tighten nut securely.
- (29) Fit shuttle driver woodruff key (2,

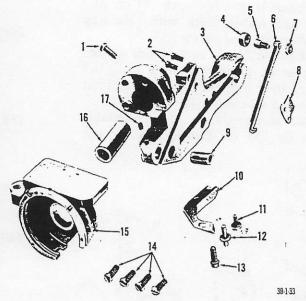


- Auxiliary takeup bracket Takeup bracket heat unit Takeup bracket heat unit clamp screws
- Thermostat bulb
- Thermostat bulb clamp Thermostat bulb clamp screw
- Thermostat bulb clamp pin
- Wax pot heat unit
- Takeup bracket heat unit clamp

Figure 32. Heat units on auxiliary takeup bracket.

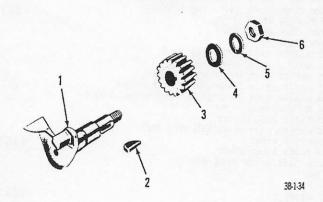
fig. 34) into key seat on shuttle driver (1).

- (30) Slide shuttle driver with key installed (7, fig. 30) into bushing in shuttle head.
- (31) Install shuttle driver pinion (3, fig. 34), flat washer (4), lockwasher (5), and nut (6) on shaft of shuttle driver extending from rear of shuttle head.
- (32) Fit side motion cam lever roll stud (28, fig. 35) into cam lever (4), fasten with external tooth lockwasher (27) and roll stud nut (26), and fit cam lever roll (29) on stud.
- (33) Place cam lever slide block stud (8) in looper bar (21) and fasten with external tooth lockwasher (19) and cam lever slide block stud nut (20).



- Shuttle head screw
- Thread hook race cap retaining screws
- Shuttle head
- Thread hook cam roll
- Thread hook cam roll stud
- Thread hook
- Thread hook cam roll stud nut
- Thread hook race cap Needle guide driving pinion bushing
- Needle plate
- Needle plate adjusting eccentric retaining screw
- Needle plate adjusting eccentric
- Needle plate retaining screw Shuttle case-to-head screws
- Shuttle case
- Shuttle head bushing Needle segment stud setscrew

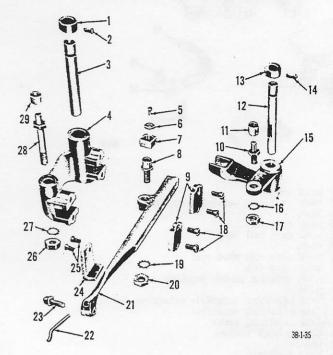
Figure 33. Stitcher shuttle head with thread hook and needle plate, exploded view.



- Shuttle driver
- Woodruff key
- 3 Pinion
- 4 Pinion flat washer
- 5 Pinion nut lockwasher
- 6 Pinion nut

Figure 34. Shuttle driver, exploded view.

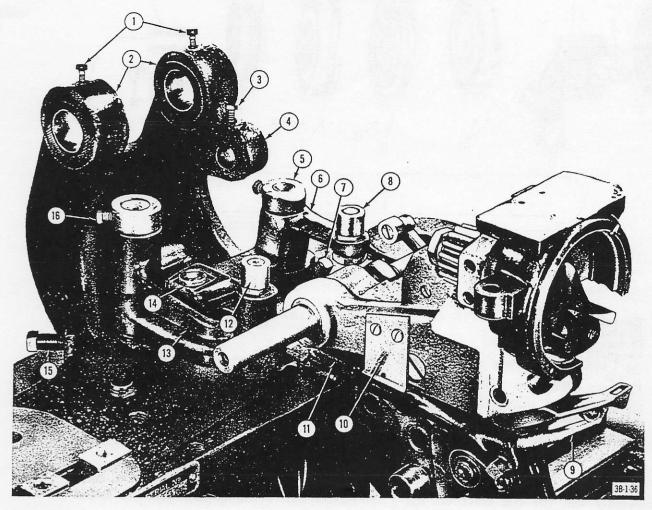
- (34) Fit cam lever slide block (7) on stud (8) and fasten block with retaining washer (6) and screw (5).
- (35) Fit looper bar in race of side motion cam lever, place cam lever caps (9) over looper bar, and lock caps and bar with cap screws (18).
- (36) Place side motion cam lever assembly (13, fig. 36) on stitcher head frame,



- Side motion cam lever pivot stud collar
- Side motion cam lever pivot stud collar screw
- Side motion cam lever pivot stud Side motion cam lever
- Cam lever slide block retaining washer screw
- Cam lever slide block retaining washer
- Cam lever slide block Cam lever slide block stud
- Cam lever caps
- 10 Forward motion cam lever roll stud
- Forward motion cam lever roll
- 12 Forward metion cam lever pivot stud
- Forward motion cam lever pivot stud collar 13
- Forward motion cam lever pivot stud collar screw 14 15
- Forward motion cam lever External tooth lockwasher 16
- Forward motion cam lever roll stud nut 17
- 18 Cam lever cap screws External tooth lockwasher
- Cam lever slide block stud nut
- Looper bar
- 22 Looper
- 23 Binding screw
- 24 Looper bar guide 25 Bar guide retaining screws
- Side motion cam lever roll stud nut
- External tooth lockwasher
- Side motion cam lever roll stud Side motion cam lever roll

Figure 35. Looper assembly, exploded view.

- alining rear hole in lever with stud hole in frame.
- (37) Insert side motion cam lever pivot stud (3, fig. 35) from underneath frame through opening in frame, and fit stud into rear hole in side motion cam lever.
- (38) Slide side motion cam lever pivot stud collar (1) on stud (3), and fasten collar with collar screw (2) in proper position (16, fig. 36).
- (39) Install side motion cam lever pivot stud setscrew (15) into stitcher head frame.
- (40) Place forward motion cam lever roll stud (10, fig. 35) in cam lever (15), fasten stud with external tooth lockwasher (16) and stud nut (17) on roll stud, and fit forward motion cam lever roll (11) on stud.
- (41) Place looper forward motion cam lever assembly (6, fig. 36) on stitcher head frame, alining hole in lever with stud hole in frame. Fit cam lever slide block (14) in race in forked end of forward motion cam lever.
- (42) Insert forward motion cam lever pivot stud (12, fig. 35) through hole in lever (15) and into stud hole in frame. Install stud collar (13) and collar screw (14) on stud in proper position (5, fig. 36).
- (43) Tighten forward motion cam lever pivot stud setscrew (7) on stud.
- (44) Install looper bar guide (24, fig. 35) on shuttle head (10, fig. 36) with bar guide retaining screws (25, fig. 35). Tighten bar guide enough to hold looper bar firmly in its lowest position, but not to bind bar. This proper installation will prevent up-and-down motion of bar.
- (45) Insert looper (22) into front opening of looper bar and tighten binding screw (23) to hold looper in place.
- (46) Install headless setscrew (15, fig. 37) and squarehead setscrew (16) in No. 2 cam (6). Repeat procedure for No. 3 cam headless setscrew (13) and squarehead setscrew (14), and fit No. 4 cam setscrews (12) in hole in cam.



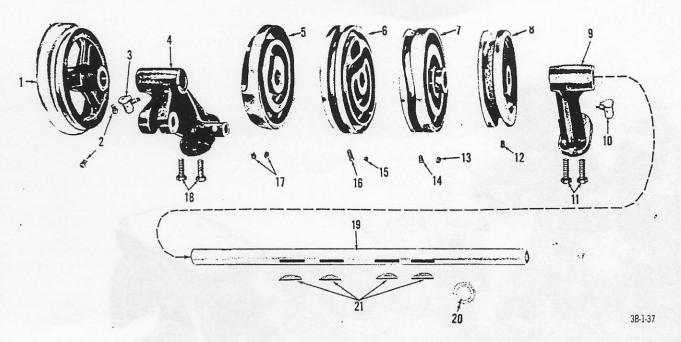
- Stitcher head cam lever shaft setscrews Stitcher head cam lever shaft supports
- 2 Stitcher head cam lever shaft supports 3 Presserfoot cam lever pivot stud setscrew 4 Presserfoot cam lever pivot stud support
- 5 Looper forward motion cam lever pivot stud collar
- 6 Looper forward motion cam lever assembly 7 Looper forward motion cam lever pivot stud set-
- 8 Looper forward motion cam lever roll

- 9 Looper
- 10 Looper bar guide
 - 11 Looper bar
- 12 Looper side motion cam lever roll
- 13 Looper side motion cam lever assembly
- 14 Looper cam lever slide block
- 15 Looper side motion cam lever pivot stud setscrew
 16 Looper side motion cam lever pivot stud collar
 screw

Figure 36. Looper assembly installed.

- (47) Fit woodruff keys (21) into key seats on camshaft (19).
- (48) Slide No. 2 cam on left side of camshaft over woodruff key. Slide No. 3 cam (7) on right side of camshaft over woodruff key, then slide No. 4 cam (8) on right side of camshaft, but do not force over woodruff key at this time. Make sure cam races on No. 4 cam face left.
- (49) Place cam lever roll stud (2, fig. 38) in hole in cam lever (3), fasten stud

- with external tooth lockwasher (4) and stud nut (5), and fit cam lever roll (1) on stud.
- (50) Place awl cam lever roll stud (4, fig. 39) in hole in awl cam lever (3), fasten stud with external tooth lockwasher (2) and roll stud nut (1), and fit cam lever roll (5) on stud.
- (51) Fit cam lever shaft setscrews (1, fig. 36) into cam lever shaft supports (2).
- (52) Fit presserfoot cam lever pivot stud setscrew (3) into stud support (4).



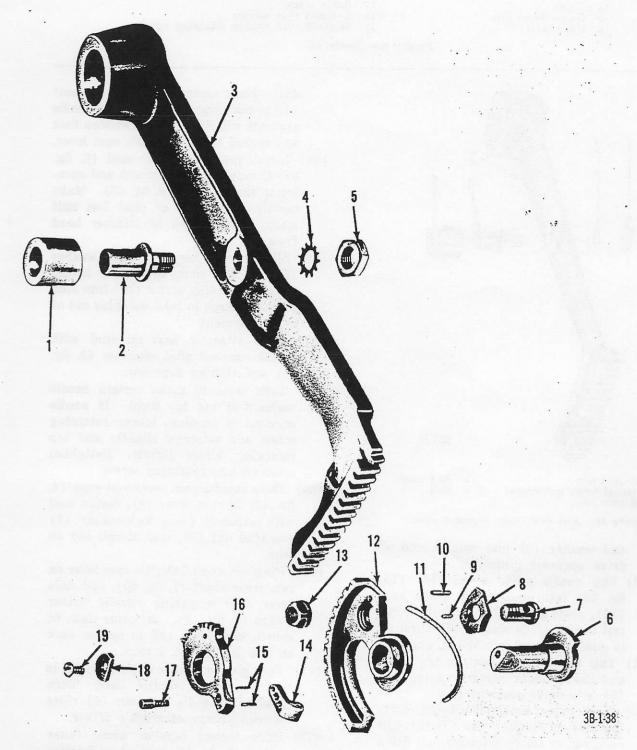
- 1 Handwheel
- 2 Handwheel setscrews
- 3 Camshaft column oiler 4 Camshaft left column
- 5 No. 1 cam (takeup, thread lock, and needle guide cam)
- 6 No. 2 cam (shuttle, needle, thread hook, and looper cam)
- 7 No. 3 cam (awl, presserfoot, thread lifter, and looper cam)
- 8 No. 4 cam (feed and thread measure cam)
- 9 Camshaft right column

- 10 Camshaft column oiler
- 11 Camshaft right column screws
- 12 No. 4 cam setscrew
- 13 No. 3 cam headless setscrew
- No. 3 cam squarehead setscrewNo. 2 cam headless setscrew
- 16 No. 2 cam squarehead setscrews
- 17 No. 1 cam headless setscrews
- 18 Camshaft left column screws
- 19 Camshaft 20 No. 4 cam
- 20 No. 4 cam spacing washer
- 21 Woodruff keys

Figure 37. Stitcher cams and camshaft, exploded.

- (53) Place needle cam lever (3, fig. 38) assembly and awl cam lever (3, fig. 39) assembly between No. 2 and No. 3 cams (6 and 7, fig. 37), fitting needle cam lever roll in race closest to shaft on right side of No. 2 cam, and awl cam lever roll in race in left side of No. 3 cam.
- (54) Place camshaft with No. 2, No. 3, and No. 4 cams, needle cam lever, and awl cam lever on stitcher head frame (fig. 40). Fit No. 2 and No. 3 cam rim races on forward and side motion looper cam lever rolls (8 and 12, fig. 33), with pivot end of needle and awl cam levers between cam lever shaft supports (2).
- (55) Fit thread hook cam roll (7, fig. 40) in cam race nearest rim on right side of No. 2 cam (9). Be sure when No. 2 cam setscrews are tightened cam clears side of thread hook by 3/64

- inch. Also No. 2 and No. 3 cams should be 15/16 inch apart or looper will bind.
- (56) Slide cam lever shaft (1) through left cam lever shaft support, through pivot end of needle cam lever and pivot end of awl cam lever, and through right cam lever shaft support. Make certain setscrew seats on shaft are facing setscrew holes. Tighten cam lever shaft setscrews (1, fig. 36), then tighten cam setscrews on camshaft just enough to hold.
- (57) Slide needle guide drive segment pinion (5, fig. 41) into opening in shuttle head (fig. 42). Slide drive segment (4, fig. 41) on extended end of pinion.
- (58) Fit binding screw (3) into drive segment, fingertight.
- (59) Place retaining washer screw (1)

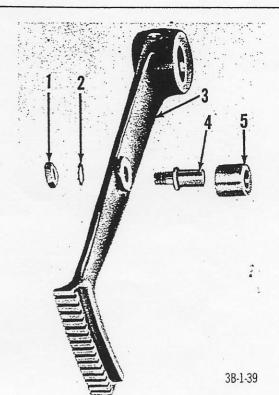


Cam lever roll
Cam lever roll stud
Cam lever
External tooth lockwasher
Cam lever roll stud nut
Segment stud
Clamp screw

1234567

Clamp assembly
Clamp block screw locating pin
Clamp block locating pin
Curved needle
Drive segment
Clamp screw nut

Figure 38. Stitcher needle cam lever, drive segment, and guide, exploded view.

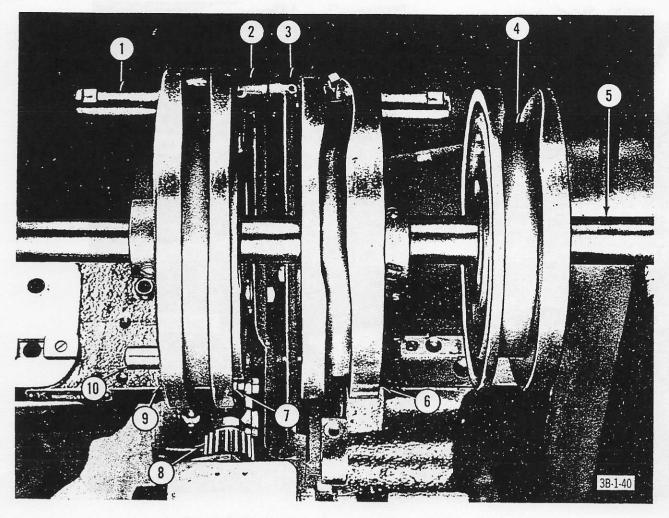


- Roll stud nut External tooth lockwasher Awl cam lever
- Roll stud
- Figure 39. Awl cam lever, exploded view.

and washer (2) into hole in end of drive segment pinion.

- (60) Tap needle guide dowel pins (15, fig. 38) into openings in guide arm (16), place guide (14) on dowel pins, and install guide screw (17) through in guide arm and into hole in guide.
- (61) Tap clamp block locating pin (10) and clamp block screw locating pin (9) into drive segment (12).
- (62) Place clamp assembly (8) on locating pins, fit clamp screw (7) through openings in clamp assembly and drive segment, and install clamp screw nut (13) on clamp screw.
- (63) Place needle guide arm with guide on forward opening of drive segment.
- (64) Turn cams until needle cam lever (3) is at its lowest position (2, fig.

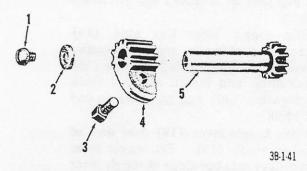
- 43). Place assembled needle segment (1) so that first tooth at top of needle segment will fit into slot between first and second teeth of needle cam lever.
- (65) Install needle segment stud (6, fig. 38) through needle segment and opening in shuttle head (8, fig. 43). Make certain small end of stud has half moon facing front of stitcher head frame.
- (66) Slide needle segment stud washer 18, fig. 38) over stud and install washer retaining screw (19) into stud tightly enough to take side play out of needle segment.
- (67) Aline setscrew seat on stud with needle segment stud setscrew (9, fig. 43) and tighten setscrew.
- (68) Turn cams to make certain needle segment is not too tight. If needle segment is binding, loosen retaining screw and setscrew slightly and tap retaining screw lightly. Retighten setscrew and retaining screw.
- (69) Place shuttle cam lever roll stud (4. fig. 44) in cam lever (1), fasten stud with external tooth lockwasher (3) and stud nut (2), and fit roll (5) on stud.
- (70) Fit pivot end of shuttle cam lever on cam lever shaft (1, fig. 40), and slide lever over engaging shuttle driver pinion (2, fig. 45). At same time, fit shuttle cam lever roll in proper race on left side of No. 2 cam.
- (71) Turn shuttle driver (3) until fork is at opening of shuttle case. Turn cams until needle segment (4) rides between prongs of shuttle driver.
- (72) Slide thread tension wheel inner washer (9, fig. 46) and wheel friction disk (10) on stud (8). Move disk against flange of stud.
- (73) Fit end of stud through lower opening of left side of stitcher head frame (fig. 47.) Screw stud nut (11, fig.



- Cam lever shaft
- Needle cam lever
- Awl cam lever
- No. 4 cam Camshaft

- No. 3 cam
- Thread hook cam roll Shuttle driver pinion
- No. 2 cam
- 10 Shuttle head stud

Figure 40. No. 2, No. 3, and No. 4 cams with needle and awl cam lever assemblies mounted on frame.



- Retaining washer screw Retaining washer Binding screw
- Drive segment
- Pinion

Figure 41. Needle guide drive segment assembly, exploded view.

- 46) on end of stud extending through right side of frame.
- (74) Slide thread tension wheel (7), wheel outer washer (6), and spring friction disk (5) on stud.
- (75) Fit release yoke guide screws (12 and 15) into release yoke (14).
- (76) Aline bottom hole in release yoke with stud hole in arm of auxiliary takeup bracket (13, fig. 30).
- (77) Insert release yoke stud (13, fig. 46) through opening in yoke and into thread stud hole in takeup bracket (5, fig. 47). Tighten stud.
- (78) Slip release collar (4, fig. 46) and

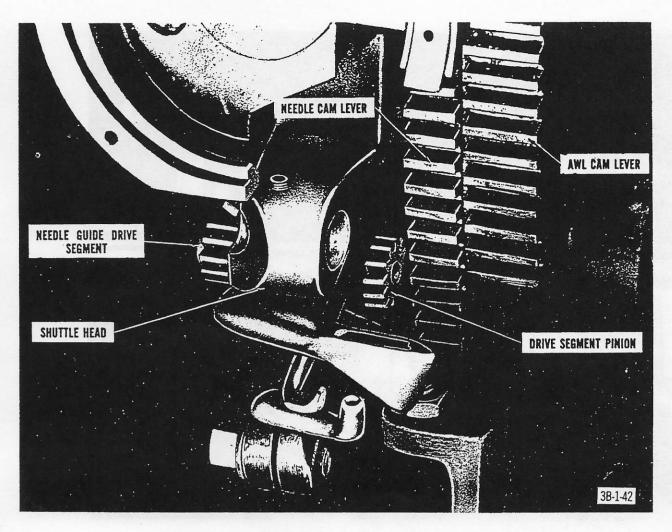


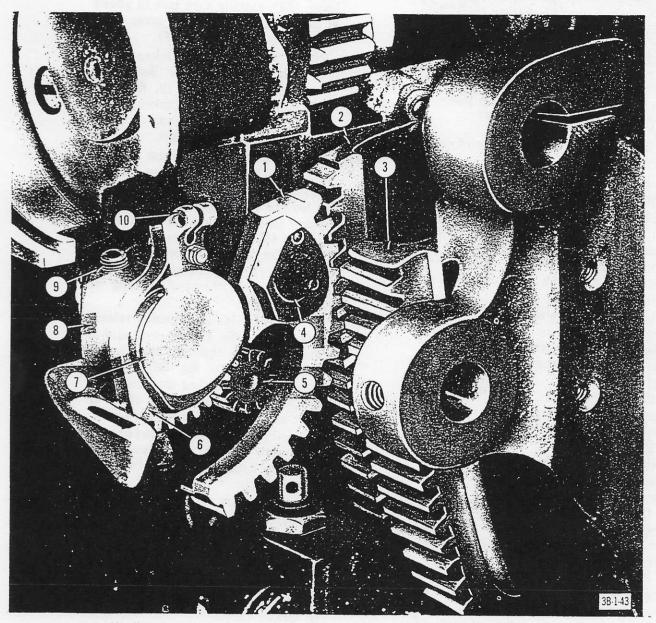
Figure 42. Needle guide drive segment with pinion installed.

- spring (3) on stud, and slide spring into opening of collar.
- (79) Screw spring adjusting disk (2) and disk lock disk (1) on stud. Make sure both disks are tightened enough so only one thread of stud shows.
- (80) Place thread lock roll stud (22, fig. 48) into auxiliary takeup bracket (2, fig. 47), screw stud nut (21, fig. 48) on stud extending from right side of frame, slide thread lock roll (24) on stud, place retaining washer (25) and screw (26) on stud, and tighten screw.
- (81) Fit end of thread lock and tension release lever (20) into opening in stitcher head frame (8, fig. 47). Turn lever until arm on lever rides on

- right side of thread tension release yoke (4).
- (82) Fit special woodruff key (35, fig. 48) in key seat on extended end of release lever.
- (83) Slip toggle lever link stud (19) through opening in toggle releasing lever (28), slide toggle lever link (16) over stud, and install external tooth lockwasher (30) and nut (31) on end of stud.
- (84) Slide toggle lever (12) over arm of rocker shaft (15). Fit toggle lever stud (11) into openings of toggle lever and arm of rocker shaft.
- (85) Install external tooth lockwasher (13) and toggle lever stud nut (14) on stud.

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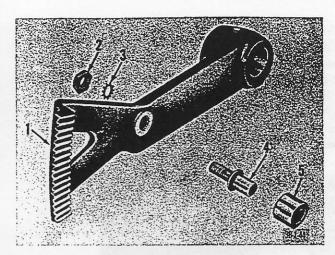
- (86) Slide rocker shaft swivel (10) into opening of toggle lever and through opening of toggle lever link, and install rocker shaft swivel washer (17) and nut (18) on swivel.
- (87) Fit round bottom woodruff key (34) into key seat on thread lock and tension release lever.
- (88) Take toggle releasing lever and rocker shaft assemblies and slip toggle releasing lever (9, fig. 49) over end of thread lock and tension release lever (10). Guide keyway in toggle releasing lever over woodruff key in thread lock and tension release lever and, at the same time, fit end of rocker shaft



- Needle segment
- Needle cam lever

- Awl cam lever Needle clamp Needle guide drive segment pinion
- Needle guide arm
- Needle segment stud
- Shuttle head
- Needle segment stud setscrew
- 10 Needle guide

Figure 43. Timing of needle cam lever and needle segment.



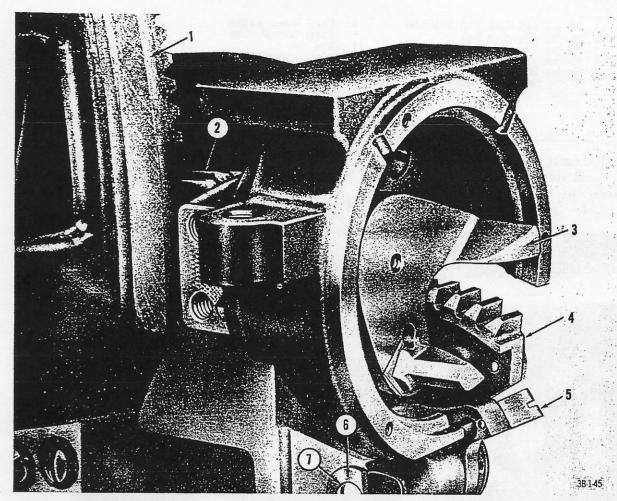
- 1 Cam lever 2 Roll stud nut
- 4 Roll stud 5 Roll
- External tooth lockwasher

Figure 44. Shuttle driver cam lever, exploded view.

in rear opening in stitcher head frame until flush.

- (89) Slide thread lock lever (23, fig. 48) on takeup lever bushing in stitcher head frame (7, fig. 49), fitting front end of lock lever under thread lock roll (8) and back end into fork of thread lock rocker shaft (11).
- (90) Install toggle releasing lever retaining screw (29, fig. 48), fingertight, through toggle releasing lever against screw seat on thread lock and tension release lever.
- (91) Screw thread lock cam roll stud (3) into cam lever (4) and fit cam roll (2) on stud.
- (92) Slide thread lock cam lever pivot stud (6) through cam lever so extended end of stud is on same side of lever as cam roll.
- (93) Connect thread lock rocker shaft swivel connector (8) to cam lever with swivel connector stud (7) and cotter pin (1).
- (94) Screw rocker shaft swivel connector nut (9) halfway up threaded end of swivel connector and fit end of swivel connector through rear opening of rocker shaft swivel (10) on machine. Install swivel connector nut (27), fingertight, on end of swivel connector. Make certain thread lock cam

- lever is in upright position and alined to left (2, fig. 49).
- (95) This phase of the assembly of the thread lock assembly is illustrated in figure 50.
- (96) Fit takeup lever thread roll (15, fig. 51) on roll stud (14) and place roll guard (16) over roll on stud. Slide stud into opening in arm of takeup lever (13), making sure hole in guard alines with dowel pin on lever arm. Fasten stud with nut (17).
- (97) Fit longest pivot end of takeup lever into bushing on stitcher head that holds thread lock lever (7, fig. 49). Slide lever to right until takeup lever thread roll (7, fig. 52) runs on track of auxiliary takeup bracket.
- (98) Slide takeup lever fulcrum bracket (21, fig. 51) into position on stitcher head frame (12, fig. 52). Fit extended end of thread lock and tension release lever into bottom opening of bracket (9), extended end of thread lock rocker shaft into top opening on bracket (4), and extended end of takeup lever in forward opening on bracket (10).
- (99) Slide thread lock and tension release lever washer (33, fig. 48) over end of lever extending through hole in fulcrum bracket (10, fig. 52). Install release lever adjusting nut and locknut (32, fig. 48) over end of lever. Leave one thread of lever exposed.
- (100) Install takeup lever fulcrum bracket short screw (20, fig. 51) through rear opening of bracket into hole in stitcher head frame.
- (101) Place fulcrum bracket long screw spacing collar (24) on long screw (25), and install screw through front opening of bracket into hole in stitcher head frame.
- (102) Install takeup lever friction spring (22) to fulcrum bracket with retaining screws (23).
- (103) Install needle guide cam lever roll stud (2, fig. 53) to cam lever (3) with external tooth lockwasher (4) and stud nut (5), and fit roll (1) on stud.



- 1 2 3 4 Shuttle cam lever Shuttle driver pinion Shuttle driver Needle segment

- Needle guide Needle segment stud washer Needle segment stud washer retaining screw

Figure 45. Timing of shuttle driver and needle segment.

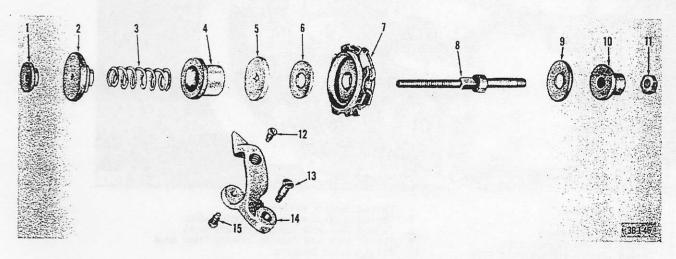


Figure 46. Thread tension assembly, exploded view.

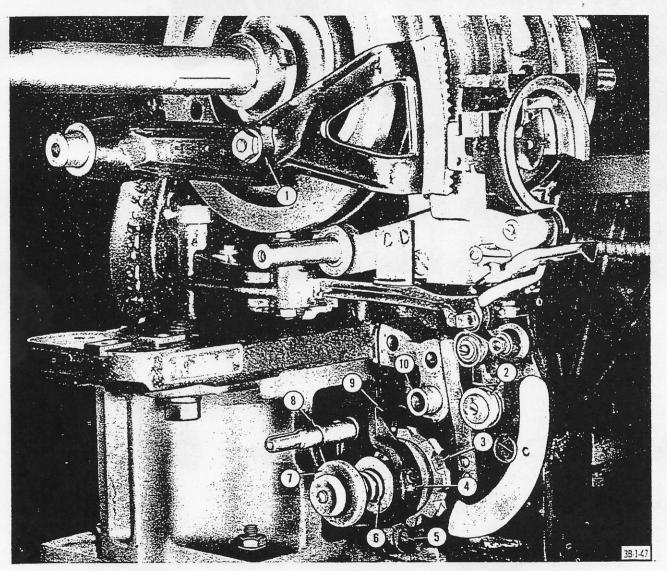
- Spring adjusting disk lock disk Spring adjusting disk
- Spring
- Release collar
- Spring friction disk
- Wheel outer washer
- Wheel Stud
- Wheel inner washer 10 Wheel friction disk
- Stud nut
- Release yoke guide screw
- Release yoke stud
- Release yoke
- Release yoke guide screw

Figure 46-Continued.

(104) Install needle guide cam lever on shuttle head stud (3, fig. 52). Slide cam lever to right, engaging lever with needle guide drive segment.

Make certain first tooth of segment fits into slot between first and second teeth of cam lever (fig. 54).

(105) Place needle guide cam lever re-

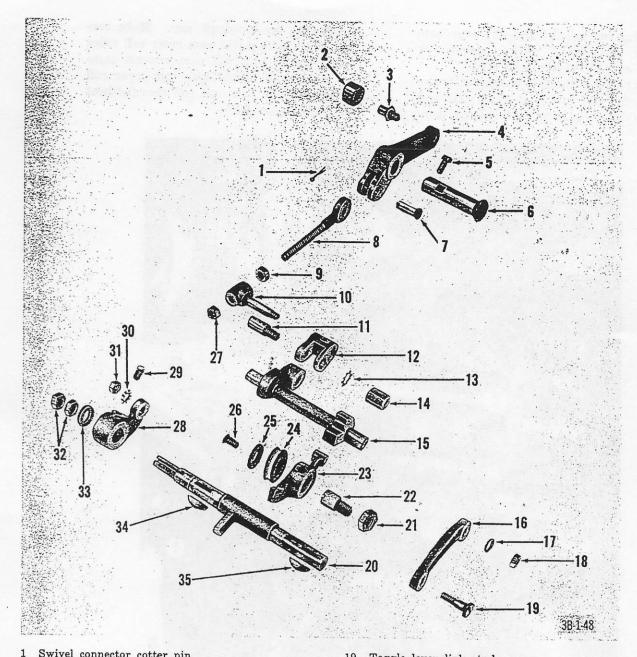


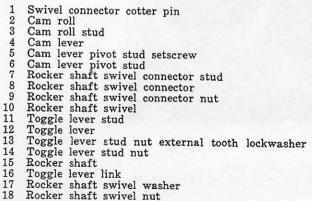
- Shuttle cam lever
- Thread lock roll
- Thread tension wheel
- Thread tension release yoke
- Thread tension release yoke stud
- Thread tension spring

- Thread tension spring adjusting disk
 Thread lock and tension release lever
 Thread lock and tension release lever arm
 Takeup lever bushing
- 10

Figure 47. Thread tension assembly installed.

1:



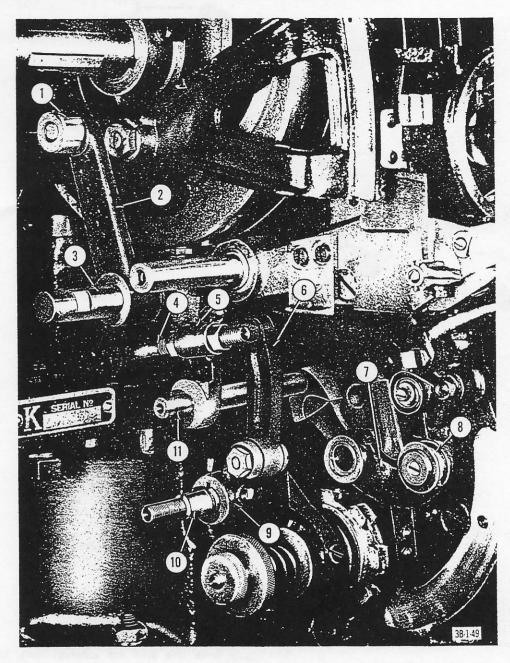


Toggle lever link stud Thread lock and tension release lever Roll stud nut Roll stud 22 23 24 25 26 27 Lever
Roll
Roll stud retaining washer
Roll stud washer retaining screw
Rocker shaft swivel connector nut
Toggle releasing lever
Toggle releasing lever retaining screw
Toggle lever link stud nut external tooth lockwasher
Toggle lever link stud nut
Thread lock and tension release lever nuts
Thread lock and tension release lever washer
Woodruff key, round bottom
Woodruff key, special Lever

Figure 48. Thread lock assembly, exploded view.

taining washer (6, fig. 53) over cam lever and install washer screw (7) into end of shuttle head stud.

(106) Screw No. 1 cam headless setscrews (17, fig. 37) into No. 1 cam (5) and slide No. 1 cam on left side of camshaft over woodruff key. Make certain needle guide cam lever roll rides in inside cam roll race nearest camshaft, and thread lock cam lever roll rides in outside cam roll race farthest from camshaft.



- Cam roll Cam lever

- Cam lever pivot stud Rocker shaft swivel connector Rocker shaft swivel
- Toggle lever link

- Lever Roll

- Toggle releasing lever Thread lock and tension release lever 10
- Rocker shaft

Figure 49. Thread lock assembly installed.

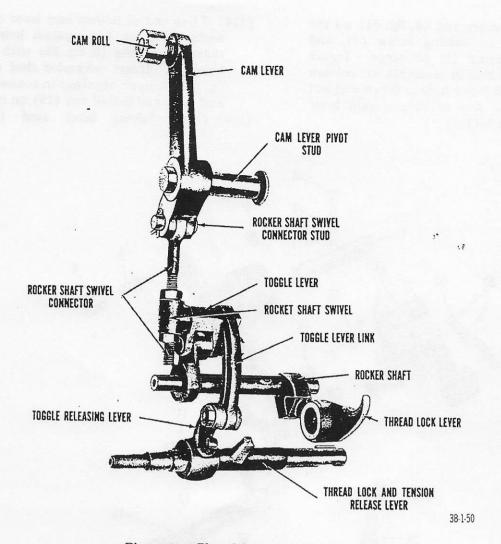


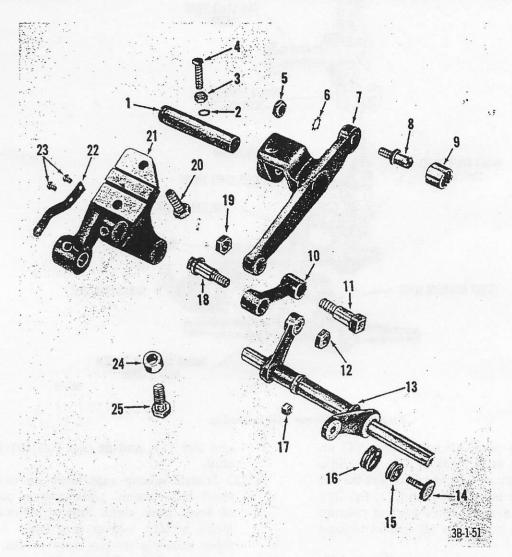
Figure 50. Thread lock assembly.

- (107) Install camshaft left column (4) on stitcher head frame (9, fig. 55). Slide column to right and insert thread lock cam lever pivot stud (1, fig. 52) through arm in lower part of column with flat surface of pivot stud toward front.
- (108) Aline setscrew seat on thread lock cam lever pivot stud with setscrew opening on camshaft left column, and install pivot stud setscrew (5, fig. 48) into hole in arm of column (7, fig. 55).
- (109) Install camshaft left column to stitcher head frame with screws (18, fig. 37) from underneath frame.
- (110) Place takeup cam lever roll stud (8, fig. 51) in stud hole in cam lever (7), fasten stud with lockwasher (6)

- and nut (5), and fit cam roll (9) on stud.
- (111) Install takeup cam lever on camshaft left column, placing open part of lever over right fork of column. Make certain takeup cam lever roll rides properly in cam race of No. 1 cam (fig. 55). Tighten No. 1 cam setscrews.
- (112) Insert takeup cam lever pivot stud (1, fig. 51) through opening in camshaft left column, and fit stud into stud holes in takeup cam lever with binding screw seat up. Push stud in until only shoulder is free (10, fig. 55). Make sure seat is matched with binding screw opening.
- (113) Screw takeup cam lever pivot stud

binding screw nut (3, fig. 51) all the way up on binding screw (4), and place washer (2) on screw. Install screw in hole in camshaft left column (3, fig. 55) and tighten screw and nut on screw seat of takeup cam lever pivot stud (10).

(114) Place end of takeup cam lever connector (10, fig. 51) against hole in takeup cam lever (8, fig. 55) with oilholes up. Insert connector stud (11, fig. 51) through openings in connector and stud, and install nut (19) on stud. (115) Insert takeup lever stud (18)

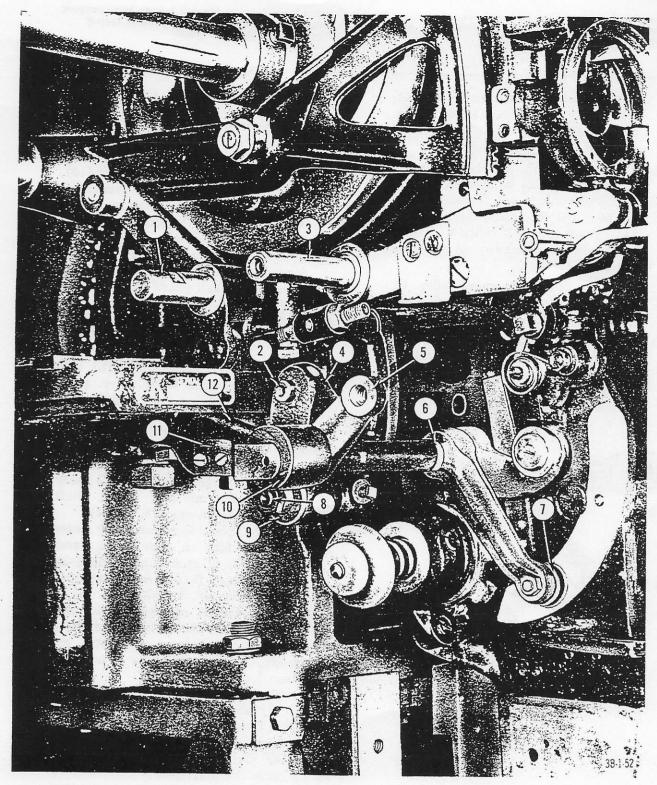


- Cam lever pivot stud Cam lever pivot stud binding screw nut washer Cam lever pivot stud binding screw nut Cam lever pivot stud binding screw
- Cam roll stud nut Cam roll stud lockwasher
- Cam lever Cam roll stud
- Cam roll Cam lever connector Cam lever connector stud
- Cam lever connector stud nut
- Lever

- Lever thread roll stud
- Lever thread roll 15
- Lever thread roll guard 16
- 17 Lever thread roll stud nut
- 18 Lever stud
- 19 Cam lever connector stud nut
- Lever fulcrum bracket short screw 20
- 21 Lever fulcrum bracket

- Lever friction spring Lever friction spring retaining screws Lever fulcrum bracket long screw spacing collar
- 25 Lever fulcrum bracket long screw

Figure 51. Thread takeup assembly, exploded view.



Thread lock cam lever pivot stud Thread lock rocker shaft Shuttle head stud Takeup lever fulcrum bracket thread lock rocker

shaft support Takeup lever arm opening for cam lever connector Takeup lever Takeup lever thread roll

Figure 52. Thread takeup assembly partially installed.

Takeup lever fulcrum bracket takeup lever support Takeup lever fulcrum bracket friction spring

Takeup lever fulcrum bracket

Figure 52-Continued.

through holes in lower end of connector and arm on takeup lever (5, fig. 52). Tighten stud in arm and screw stud nut (12, fig. 51) on stud.

- (116) Install 2 handwheel setscrews (2, fig. 37) in hub of handwheel (1), fit handwheel on left side of camshaft (1, fig. 55), and slide handwheel to right against left camshaft column. Tighten handwheel setscrews on seats on camshaft.
- (117) Screw camshaft column oiler (3, fig. 37) into column; oil fill lid must be up (fig. 55).
- (118) Install presserfoot actuating slide front gib (1, fig. 56) on right side of stitcher head frame (1, fig. 57) with 2 retaining screws (2, fig. 56), and install rear gib (6) on frame (3, fig.

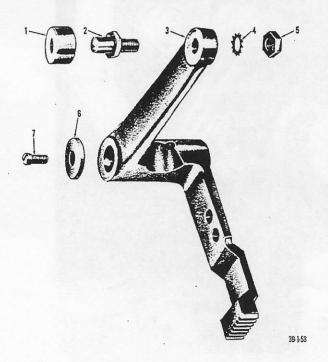


Figure 53. Needle guide cam lever, exploded view.

- Roll
- Roll stud Cam lever
- External tooth lockwasher
- Roll stud nut Retaining washer
- Washer screw

- 57) with 3 retaining screws (7, fig. 56).
- (119) Slip presserfoot actuating slide (3) between front and rear gibs from top.
- (120) Place thread measure thread roll (22, fig. 58) on thread roll lever (18), insert thread roll lever and thread roll stud (21) through openings in roll and lever, and handtighten screw stud nut (23) on stud.
- (121) Place thread roll guard (19) over thread roll, aline holes in guard and lever, and install guard screw (20).
- (122) Tighten stud nut (23).
- (123) Tighten thread roll lever setscrew (17) in thread roll lever one complete turn.
- (124) Insert slide block stud (13) into opening in slide block lever (14), screw nut (15) on stud, and fit slide block (12) on other end of stud.
- (125) Screw slide block lever setscrew (25) 1 complete turn in lever (14).
- (126) Place slide block lever assembly on slide block lever pivot stud (27); keep flat surfaces up and install shaft washer (24) on stud (8, fig. 57).
- (127) Slide presserfoot unlocking lever (16, fig. 58) on slide block lever pivot stud, fit stud into opening on stitcher head frame, and slide stud into position (8, fig. 57).
- (128) Place thread measure thread roll lever assembly on end of thread measure slide block lever pivot stud extended through left side of stitcher head frame (16, fig. 57).
- (129) Tighten setscrews, referred to in (123) and (125) above, on seats of slide block lever pivot stud.
- (130) Insert thread measure slide block lever pivot stud oiling cup (11) in stitcher head frame.
- (131) Slip end of presserfoot actuating slide-to-lock release link (4, fig. 56) through opening in stitcher head frame (9, fig. 57) and install link up-

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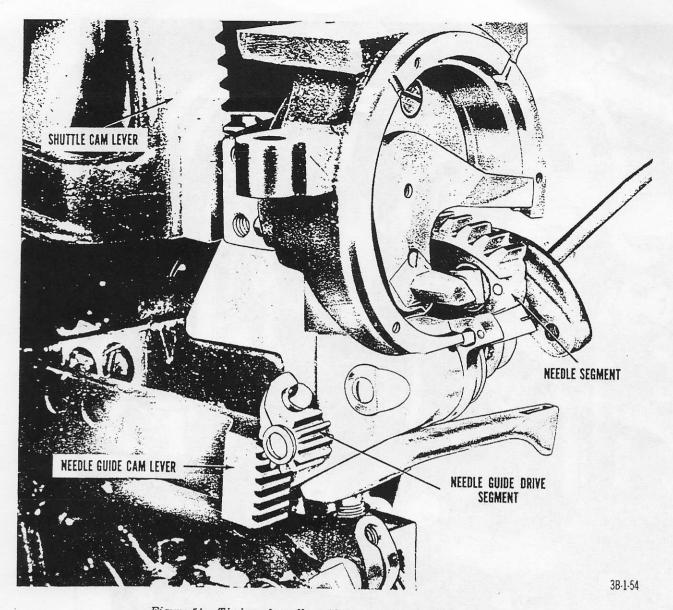
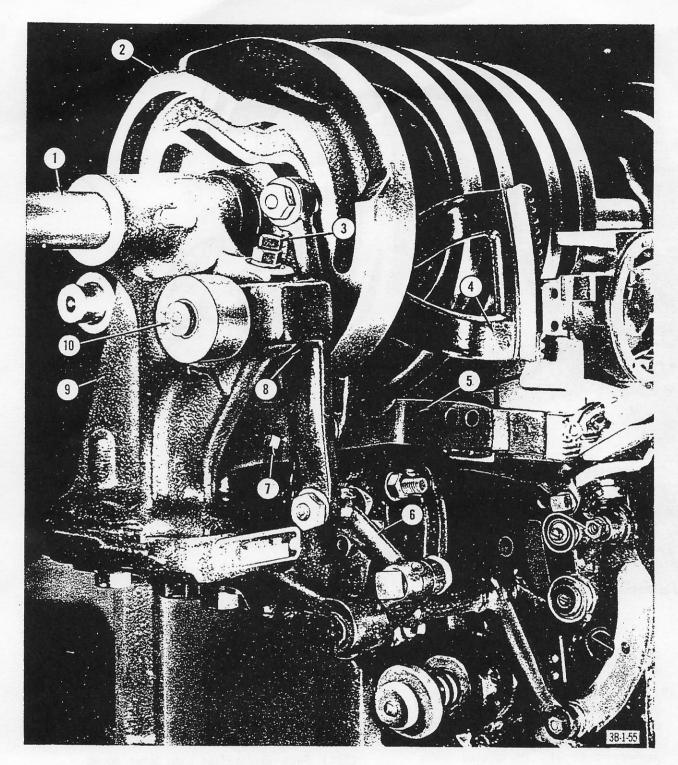


Figure 54. Timing of needle guide cam lever and drive segment.

per stud (5, fig. 56) through opening of link into slide (3).

- (132) Slide presserfoot-to-lock release lever shaft lever (9) on extended end of thread lock and tension release lever under shelf of frame, guiding keyway over key in release lever. Make certain end of lever with one hole points to rear of stitcher head frame (3, fig. 59).
- (133) Install presserfoot-to-lock release shaft lever setscrew (10, fig. 56) in shaft lever (4, fig. 59).

- (134) Install slide-to-lock release link lower stud (8, fig. 56) through opening in link and into release lever shaft lever.
- (135) Screw link lower stud nut (11) on link lower stud.
- (136) Slide presserfoot cam lever eccentric release lever collar (35, fig. 60) and eccentric release lever (34) on shuttle head stud (5, fig. 57). Make certain longest end of lever points to rear of stitcher head frame.
- (137) Place cam roll stud (2, fig. 60) into



Camshaft

No. 1 cam
Takeup cam lever pivot stud binding screw
Shuttle cam lever
Needle guide cam lever

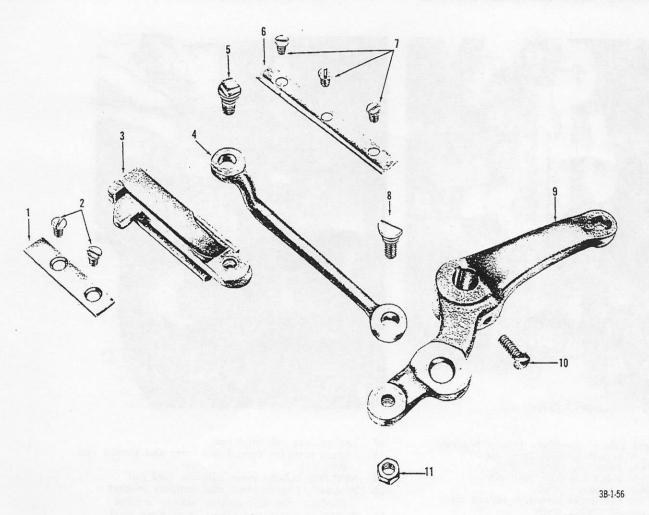
1 2 3 4 5

6 Takeup cam lever connector
7 Thread lock cam lever pivot stud setscrew
8 Takeup cam lever
9 Left camshaft column
10 Takeup cam lever pivot stud

Figure 55. No. 1 cam and left camshaft column installed.

- center hole of cam lever (6), fasten stud with external tooth lockwasher (5) and stud nut (4), and fit cam roll (1) on stud.
- (138) Tap cam lever bushing (9) into cam lever opening, fit cam lever eccentric assembly (38) into bushing, and install eccentric retaining washer (8) and screw (7) on end of eccentric assembly.
- (139) Fit eccentric assembly spring screw (39) into hole in eccentric assembly.
- (140) Install presserfoot cam lever on right side of frame by sliding cam roll

- (2, fig. 61) into outside cam race of No. 3 cam. The eccentric roll, on edge of eccentric assembly, should be in its upmost position.
- (141) Fit presserfoot cam lever pivot stud (3, fig. 60) through opening in cam lever and into support in frame (4, fig. 36) just below and to front of cam lever shaft.
- (142) Tap presserfoot cam lever eccentric spring pin (41, fig. 60) into opening on stitcher head frame, below and to rear of cam lever shaft (4, fig. 61), and hook short end of spring (40, fig.



- Front gib
- 2 Front gib retaining screws
- 3 Slide
- Slide-to-lock release link
- Slide-to-lock release link upper stud
- Rear gib

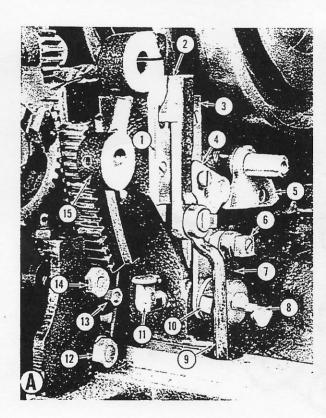
- Rear gib retaining screws

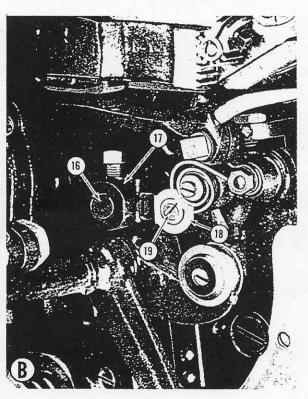
- Slide-to-lock release link lower stud
 Presserfoot-to-lock release lever shaft lever
 Presserfoot-to-lock release shaft lever setscrew
- 11. Slide-to-lock release link lower stud nut

Figure 56. Presserfoot actuating slide assembly, exploded view.

- 60) on pin, and long end of spring on spring screw (11, fig. 61).
- (143) Insert presserfoot bar nut (36, fig. 60) in bar locking dog (37), insert locking dog inside bar adjusting sleeve (10), and fit sleeve into opening in adjusting sleeve block (11).
- (144) Screw bar adjusting nut (14) on extended end of sleeve until only 1 thread is exposed on sleeve.
- (145) Screw bar sleeve adjusting screw (16) through threaded hole in sleeve adjusting nut and into adjusting sleeve block (11), tighten screw 3 complete turns, and install sleeve ad-

- justing screw lock screw (15) into adjusting nut, fingertight.
- (146) Install bar adjusting sleeve assembly on extended end of shuttle head stud next to cam lever eccentric release lever (5, fig. 57). Slide sleeve block retaining washer (12, fig. 60) over end of shuttle head stud, and install screw (13) in end of stud (14, fig. 61).
- (147) Install presserfoot raising lever (22, fig. 60) on lever (24) with 2 screws (21).
- (148) Install presserfoot (31) on lever with 2 retaining screws (23).

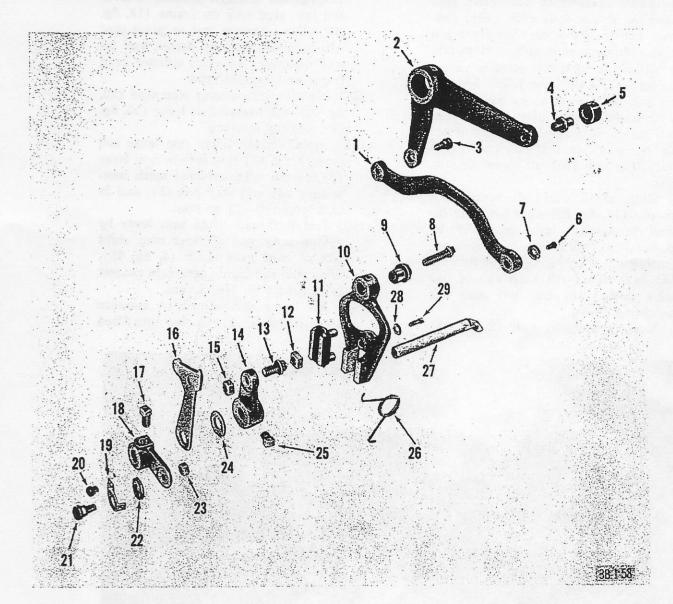




- A-Right side of auxiliary takeup bracket
- Presserfoot actuating slide front gib
- Presserfoot actuating slide
- Presserfoot actuating slide rear gib
- Presserfoot unlocking lever
- Presserfoot cam lever eccentric release lever
- Thread measure slide block
- Thread measure slide block lever
- Thread measure slide block lever pivot stud
- Presserfoot actuating slide-to-lock release link Thread measure slide block lever setscrew
- Thread measure slide block lever pivot stud oiling cup
- Thread lock roll stud nut
- Thread measure thread roll lever and thread roll stud nut
- 14
- Auxiliary takeup lever fulcrum stud nut Presserfoot lever pivot stud support bracket
- B-Left side of auxiliary takeup bracket Thread measure slide block lever pivot stud
- 17 Thread measure thread roll lever
- Thread measure thread roll guard 18
- Thread measure thread roll and thread roll lever stud

Figure 57. Presserfoot actuating slide and thread measure assemblies, partially installed.

(149) Tighten channel knife adjusting screw (30) in threaded opening of presserfoot, place channel knife clamp (28) on presserfoot, insert clamp screw (27) through hole in clamp and into presserfoot 1 complete turn, slide

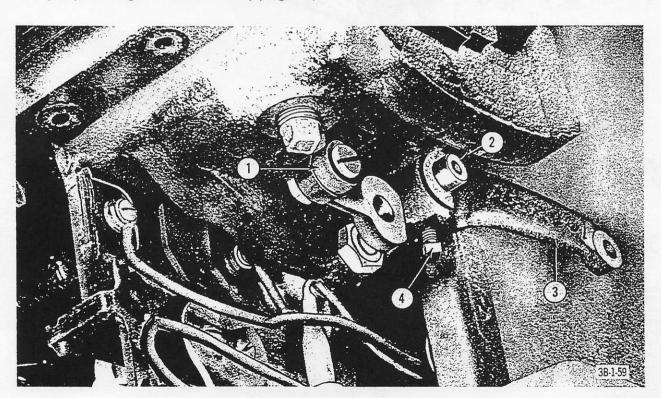


Cam lever connector Presserfoot unlocking lever Cam lever Thread roll lever setscrew 17 Cam lever connector stud Thread roll lever 18 Cam lever roll stud Thread roll guard 19 Cam lever roll Thread roll guard screw Cam lever connector retaining collar washer screw 21 Thread roll lever and thread roll stud Cam lever connector retaining collar washer Thread roll 22 Adjusting bracket eccentric stud screw Thread roll lever and thread roll stud nut Adjusting bracket eccentric Adjusting bracket Shaft washer Adjusting slide
Slide block lever slide block
Slide block lever slide block stud
Slide block lever Slide block lever setscrew Adjusting bracket spring Slide block lever pivot stud Adjusting slide retaining collar washer 28 Slide block lever nut Adjusting slide retaining collar washer screw

Figure 58. Thread measure assembly, exploded view.

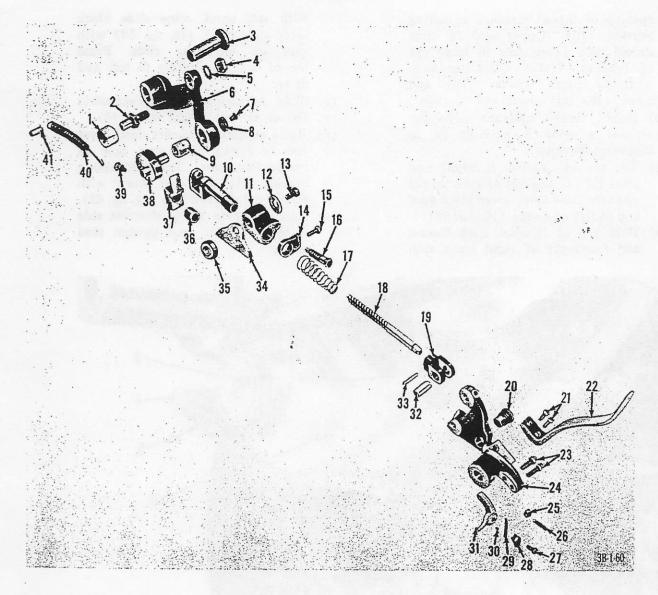
- channel knife (29) into slot between presserfoot and knife clamp, and tighten channel knife clamp screw.
- (150) Insert presserfoot bar (18) into opening of bar connector (19), connect bar to connector with rivet pin (33), and peen both ends of rivet pin.
- (151) Attach bar and connector to presserfoot lever with lever-to-bar connector pin (32), aline screw seat of pin with screw hole in lever, install lever pin retaining screw (26) into lever, tighten screw against pin, and install adjusting nut (25) on screw (3, fig. 62).
- (152) Slide small end of presserfoot spring (17, fig. 60) onto bar, and install presserfoot lever assembly by pushing bar into hole in bar sleeve adjusting nut (16, fig. 61) and turning bar back and forth until end of bar slips down into bar nut and bar adjusting sleeve.
- (153) Move presserfoot lever (2, fig. 62)

- to left until pivot end of lever rests across stud support (fig. 62).
- (154) Install presserfoot lever pivot stud (14, fig. 63) through opening in lever and into stud hole on frame (13, fig. 62), aline setscrew seat on pivot stud with setscrew hole on frame, and install setscrew (14) into stitcher head frame and against stud.
- (155) Fit presserfoot lever stop stud (20, fig. 60) into presserfoot lever (12, fig. 62), and tighten stud.
- (156) Install thread lifter cam lever roll stud (2, fig. 63) into hole in cam lever (3), fasten with external tooth lockwasher (4) and stud nut (5), and fit cam lever roll (1) on stud.
- (157) Install thread lifter cam lever by sliding pivot end of lever over right side of cam lever shaft (4, fig. 62). Slide cam roll inside cam race nearest to camshaft on No. 3 cam.
- (158) Fit lower end of thread measure adjusting slide (11, fig. 58) into fitted



- Presserfoot actuating slide-to-lock release link
- Thread lock and tension release lever
- Presserfoot-to-lock release lever shaft lever
- Presserfoot-to-lock release lever shaft lever set-

Figure 59. Presserfoot-to-lock release lever shaft lever installed.



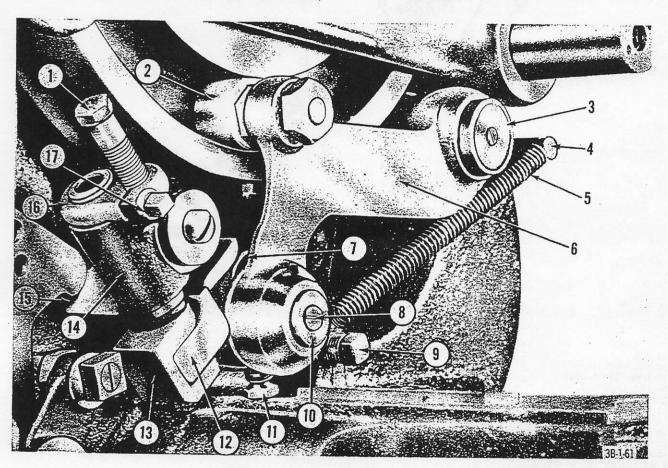
Cam roll cam roll stud Raising lever 23 Retaining screws Cam lever pivot stud 24 Lever Cam roll stud nut Lever pin retaining screw adjusting nut External tooth lockwasher 26 Lever pin retaining screw Cam lever 27 Channel knife clamp screw Cam lever eccentric retaining washer screw Cam lever eccentric retaining wasner screw
Cam lever eccentric retaining washer
Cam lever bushing
Presserfoot bar adjusting sleeve
Bar adjusting sleeve block
Bar adjusting sleeve block retaining washer
Bar adjusting sleeve block retaining washer screw
Bar sleeve adjusting nut
Bar sleeve adjusting screw lock screw
Bar sleeve adjusting screw 28 Channel knife clamp 29 Channel knife Channel knife adjusting screw Preserfoot
Lever-to-bar connector pin
Bar connector rivet pin
Cam lever eccentric release lever
Cam lever eccentric release lever 31 32 33 34 Bar sleeve adjusting screw Bar nut Bar locking dog Cam lever eccentric assembly Spring Bar 19 Bar connector 39 Cam lever eccentric spring screw 20 21 Lever stop stud 40 Cam lever eccentric spring Raising lever screws 41 Cam lever eccentric spring pin

Figure 60. Presserfoot raising lever assembly, exploded view.

opening of thread measure adjusting bracket (10). Upper end of slide should then swing free in large eve of bracket. Install adjusting slide retaining collar washer (28) and screw (29) into lower end of slide.

- (159) Install thread measure adjusting bracket and slide (8 and 9, fig. 62) in following sequence:
 - (a) Tilt top of bracket to right and place fork of bracket astride thread measure slide block lever pivot stud and to left of flange (10, fig. 62).
 - (b) Hold top of bracket with thumb and forefinger of right hand and.

- with left hand, aline slide block lever slide block (12, fig. 58) with race on adjusting slide. Press top of bracket slightly to left and down.
- (c) Slide adjusting bracket eccentric (9) on eccentric stud screw (8).
- (d) Raise adjusting bracket until pivot end is alined with stud hole in presserfoot lever. Insert adjusting bracket eccentric stud screw with eccentric into stud hole (11, fig. 62).
- (e) Hold eccentric so its shortest side is toward front, and tighten stud screw.

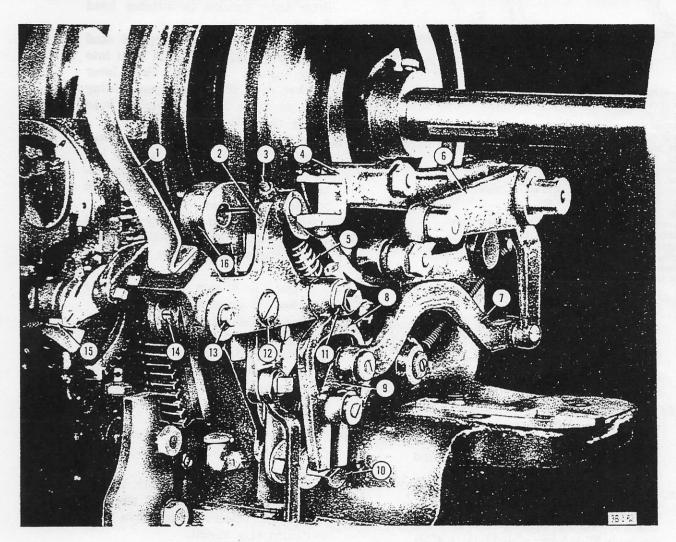


- Bar sleeve adjusting screw
- Cam roll Cam lever pivot stud
- Cam lever eccentric spring pin
- Cam lever eccentric spring
- Cam lever
- Cam lever eccentric assembly
- Cam lever eccentric retaining washer screw
- Looper cam lever forward motion pivot stud set-
- 10 Cam lever eccentric retaining washer
- 11 Cam lever eccentric spring screw
- Bar locking dog 12
- Bar adjusting sleeve 13
- Bar adjusting sleeve block 14
- 15 Cam lever eccentric release lever
- 16 Bar sleeve adjusting nut
- 17 Bar sleeve adjusting screw lock screw

Figure 61. Presserfoot cam lever and bar adjusting sleeve block assembly installed.

- (f) Slide bearing surface opening in end of thread measure cam lever connector (1, fig. 58) over upper free end of adjusting slide, being sure to keep oilhole of connector in upright position.
- (g) Install cam lever connector to adjusting slide with retaining collar washer (7) and screw (6).
- (160) Screw cam lever roll stud (4) into

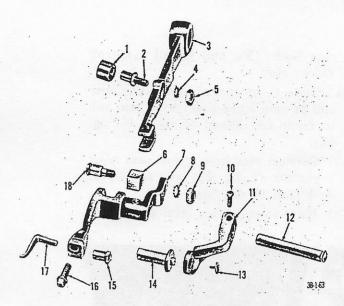
- cam lever (2), and install cam roll (5) on stud.
- (161) Slide pivot end of cam lever over end of cam lever shaft with cam roll to front and alined to right (6, fig.
- (162) Connect stud hole end of cam lever connector (7, fig. 62) and cam lever with stud (3, fig. 58).
- (163) Place thread lifter lever slide block



- Presserfoot raising lever Presserfoot lever
- Presserfoot lever retaining pin screw
- Thread lifter cam lever
- Presserfoot spring
- Thread measure cam lever
- Thread measure cam lever connector
- Thread measure adjusting bracket
- Thread measure adjusting slide

- Thread measure slide block lever pivot stud 10
- Thread measure adjusting bracket eccentric 11
- Presserfoot lever stop stud Presserfoot lever pivot stud
- 13
- Presserfoot lever pivot stud setscrew 14
- Presserfoot
- Thread lifter lever bracket with stud support, in 16 stitcher frame

Figure 62. Presserfoot raising lever assembly; thread measure assembly installed with thread lifter cam lever.



Cam lever roll Cam lever roll stud

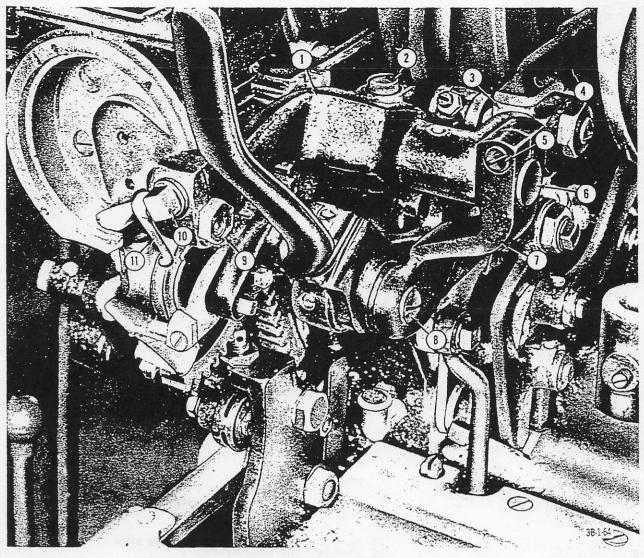
3

- Cam lever
- External tooth lockwasher
- 5 Cam lever roll stud nut
- Lever slide block
- Lever
- External tooth lockwasher 8
- Lever slide block stud nut
- 10 Lever stud support bracket clamp screw
- Lever stud support bracket
- Lever pivot stud
- Presserfoot lever pivot stud retaining screw
- Presserfoot lever pivot stud
- Eccentric stud
- Binding screw 16
- 17 Thread lifter
- Slide block stud

Figure 63. Thread lifter assembly, exploded view.

- (6, fig. 63) against opening in lever (7), and install stud (18) through block into lever. Fasten stud with external tooth lockwasher (8) and nut (9).
- (164) Fit thread lifter eccentric stud (15) into opening in lever, and install thread lifter (17) into stud. Install binding screw (16) into lever, and tighten screw to hold stud.
- (165) Place pivot section of thread lifter lever astride thread lifter lever bracket (16, fig. 62) on stitcher head frame. Slide lever slide block in slide block race at end of cam lever.
- (166) Aline pivot point of thread lifter lever with stud hole in thread lifter lever bracket on stitcher head frame, and insert lever pivot stud (12, fig. 63) through openings in lever stud

- support bracket (11) and thread lifter lever, and into stud hole on frame.
- (167) Slide lower end of thread lifter lever stud support bracket over end of presserfoot lever pivot stud, and install retaining screw (13) to hold bracket to stud.
- (168) Install thread lifter lever pivot stud support bracket clamp screw (10) into hole in support bracket.
- (169) Install thread lifter lever pivot stud binding screw (2, fig. 64) into thread lifter lever bracket in stitcher head frame.
- (170) Install feed cam lever pivot stud setscrew (5, fig. 65) 1 full turn into lever bracket (4), and slide lever bracket over short and long seating keys on right side of stitcher head frame (fig. 66).
- (171) Aline holes in feed cam lever bracket with hole in long seating key and frame, and install bracket retaining screw (3, fig. 65) through bracket into frame.
- (172) Slide No. 4 cam, already installed on camshaft, over woodruff key, fitting thread measure cam roll in cam race.
- (173) Place No. 4 cam spacing washer (20, fig. 37) on camshaft.
- (174) Place camshaft right column (9) on right end of camshaft (fig. 66). Slide column to left until screw holes in lower end of column aline with holes in base, and install screws (11, fig. 37) from underneath stitcher frame into column (fig. 66).
- (175) Slide No. 4 cam to right until it is flush with cam spacing washer, and tighten setscrew.
- (176) If shaft is not flush with hub of handwheel on left side of machine. loose cam setscrews and move shaft until properly alined.
- (177) Install camshaft right column oiler (10, fig. 37) with oil fill in upright position (fig. 66).
- (178) Place feed slide retaining plate (9, fig. 67) on frame with half moon on plate facing to rear (fig. 66), and



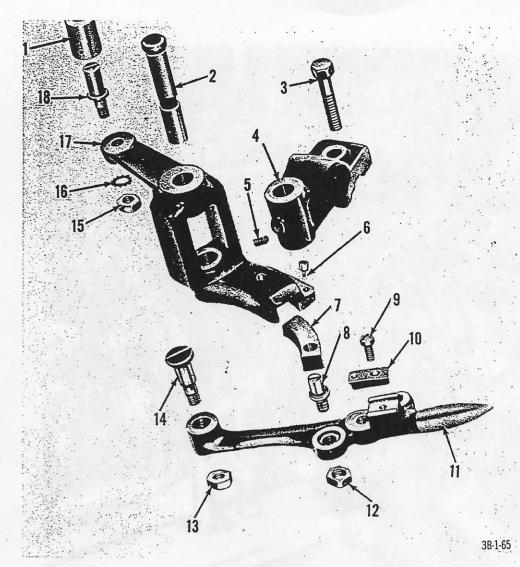
- Lever
- Lever pivot stud binding screw Lever slide block
- Cam lever
- Lever stud support bracket clamp screw
 - Lever pivot stud

- Lever stud support bracket Presserfoot lever pivot stud retaining screw 8
- Eccentric stud
- Binding screw Thread lifter

Figure 64. Thread lifter assembly completely installed.

install squarehead screw (7, fig. 67), and two fillister head screws (8).

- (179) Insert oil wicks (21) into wick openings and slots in retaining gib (18), wearing strip (16), and feed slide (15). Make certain ends of oil wicks on retaining gib are in oil reservoir in frame.
- (180) Install retaining gib on frame (fig. 66) with screws (20) and washers
- (19); screws are installed from underneath frame. Do not tighten screws completely at this time.
- (181) Install feed slide wearing strip to bottom of feed slide by inserting wearing strip screws (17) through wearing strip into feed slide.
- (182) Place feed adjusting lever slide block pivot stud (8, fig. 65) into feed



Roll Pivot stud Bracket retaining screw Bracket Pivot stud setscrew Stop screw Feed adjusting lever slide block Feed adjusting lever slide block pivot stud Shoe feed and guide handle retaining plate screw

Shoe feed and guide handle retaining plate

Shoe feed and guide handle Feed adjusting lever slide block stud nut Feed adjusting lever pivot stud nut 12 13

Feed adjusting lever pivot stud

Feed cam lever roll stud nut External tooth lockwasher

Feed cam lever

Roll stud

Figure 65. Feed cam lever assembly, exploded view.

and guide handle (11), and install stud nut (12) on stud.

(183) Connect feed and guide handle to rear hole of feed adjusting lever bracket (14, fig. 67) with lever pivot stud (14, fig. 65) and stud nut (13).

(184) Place feed adjusting lever bracket on feed slide with bracket adjusting stud (11, fig. 67) between upright forks of bracket.

(185) Slide bracket over key until bracket adjusting stud is alined with bottom stud hole in feed slide, then tighten adjusting stud in feed slide bottom hole until thread hole under bracket, in key on feed slide, is alined with rear forks of bracket.

(186) Install lever bracket binding screw (12) and washer (13), fingertight,

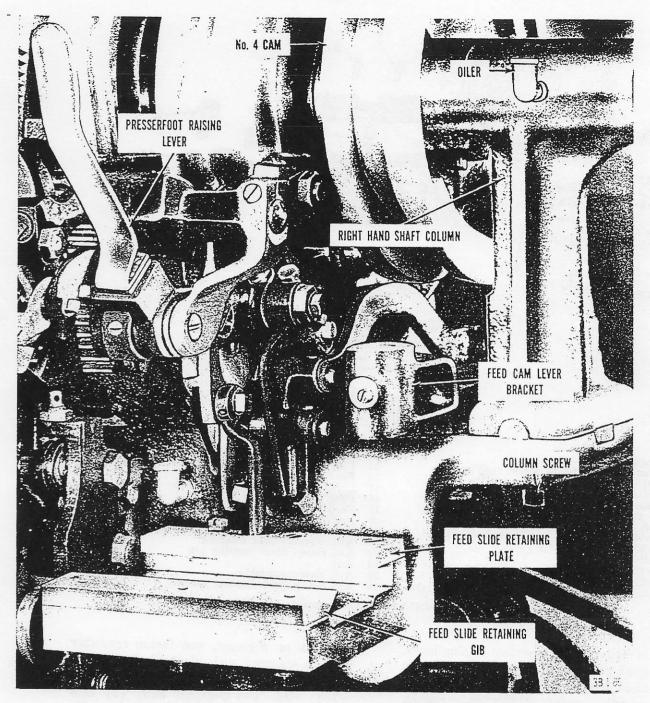


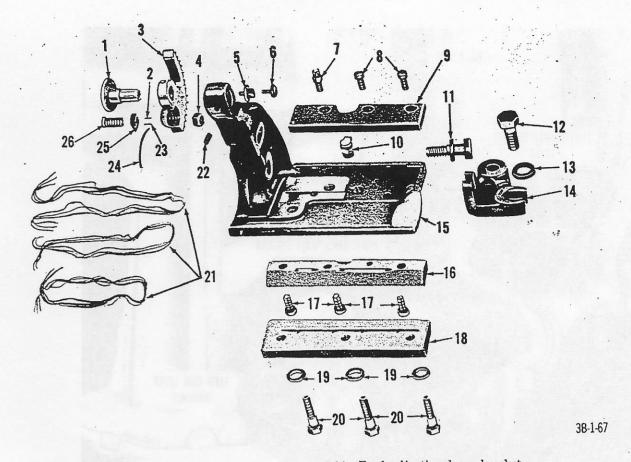
Figure 66. Feed cam lever bracket installed with right hand shaft column and No. 4 cam.

over forks of bracket (14) and into feed slide.

- (187) Screw feed slide oiler (10) into center hole of feed slide.
- (188) Install feed slide assembly with feed and guide handle on stitcher head

frame in recess formed by feed slide retaining plate and retaining gib (figs. 66 and 68).

- (189) Drop ends of oil wicks into oil reservoir under feed slide.
- (190) Move feed slide to left until contact



Awl segment stud Awl clamp block binding screw locating pin

3 Awl segment

Awl clamp block binding screw nut Awl segment stud retaining screw

Awl segment stud retaining screw binding screw

Feed slide retaining plate squarehead screw Feed slide retaining plate fillister head screws

Feed slide retaining plate

Feed slide oiler

Feed adjusting lever bracket adjusting stud 11

Feed adjusting lever bracket binding screw 12

Feed adjusting lever bracket binding screw washer

Feed adjusting lever bracket

Feed slide

Feed slide wearing strip Feed slide wearing strip screws

Feed slide retaining gib

Feed slide retaining gib washers

Feed slide retaining gib screws

Oil wicks

21 Awl segment stud setscrew 22

Awl clamp block locating pin 23

24 Awl

Awl clamp assembly 25

26 Awl clamp block binding screw

Figure 67. Feed slide assembly with awl segment, exploded view.

is made with presserfoot raising lever, push presserfoot hand lever back, and slide head of feed slide to position directly under presserfoot raising lever (fig. 68).

(191) Tap awl clamp block locating pin (23, fig. 67) into front hole of awl segment (3), and tap block binding screw locating pin (2) into rear hole of awl clamp assembly (25).

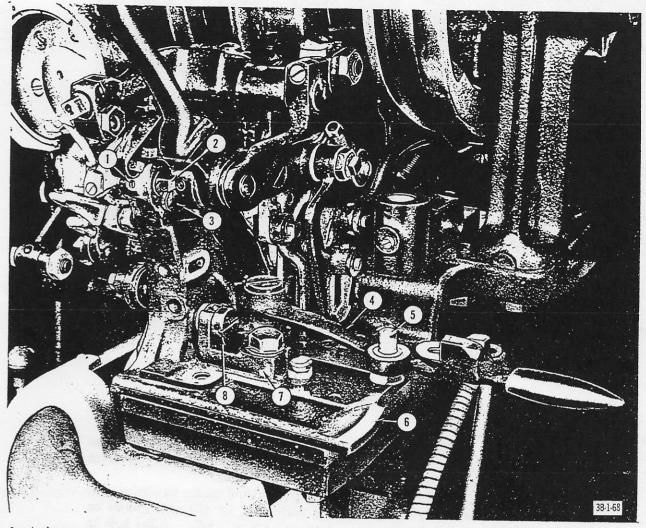
(192) Place awl clamp assembly on awl segment, guiding assembly on locating

pin on segment, and fasten assembly to segment with block binding screw (26) and nut (4).

(193) Slide awl segment stud (1) into hole in segment from left to right with awl clamp facing front.

(194) Turn cams until awl cam lever is at its lowest position.

(195) Install assembled awl segment between head of feed slide and needle segment so that first tooth at top of awl segment will fit into slot between



Awl segment stud setscrew

Awl segment stud retaining screw

Awl segment stud retaining screw binding screw

Feed and guide handle

Feed adjusting lever slide block pivot stud

Feed slide

Feed adjusting lever bracket Feed adjusting lever bracket adjusting stud

Figure 68. Feed slide assembly with feed and guide handle and awl segment installed.

second and third tooth of awl cam lever (A, fig. 69).

(196) Push awl segment stud into its seat on feed slide, aline setscrew seat on stud with setscrew seat on feed slide by alining shoulder on stud with top of awl clamp, and install stud setscrew (22, fig. 67) in feed slide.

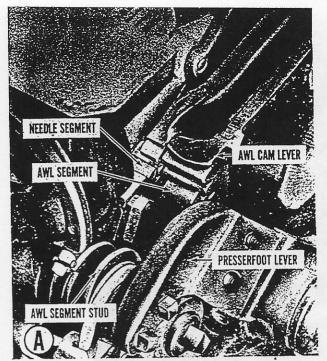
(197) Push feed slide to left until it is flush against awl segment (B, fig. 69).

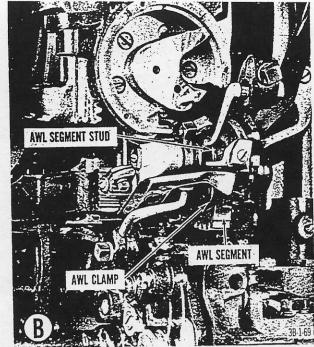
(198) Install stud retaining screw (5, fig. 67) in end of stud and tighten screw sufficiently to remove side play from segment.

(199) Push feed slide to right about 1/4. inch so needle and awl segments will not touch each other.

(200) Turn cams to check for binding in awl segment. If awl segment binds, loosen awl segment stud retaining screw slightly and tap screw lightly. Check again for binding. If awl segment still binds, loosen screw slightly and tap again, being careful not to loosen so much that side play occurs.

(201) Install awl segment stud retaining screw binding screw (6) into small screw hole in head of feed slide (3,





A-Awl segment timed with awl cam lever

B-Awl segment installed

Figure 69. Awl segment installation.

fig. 68), and tighten binding screw to lock retaining screw in place.

(202) Tighten awl segment stud setscrew(1) on setscrew seat on stud.

(203) Place feed cam lever roll stud (18, fig. 65) into feed cam lever (17), install external tooth lockwasher (16) and stud nut (15) on stud, and fit roll (1) on stud.

(204) Install feed cam lever stop screw(6) into hole in lever.

(205) Fit feed adjusting lever slide block (7) over feed pivot stud (8) in shoe feed and guide handle on frame, aline slide block with slide block race on bottom of feed cam lever, and place cam lever down over slide block.

(206) Slide feed cam lever into position on bracket by turning cams until cam lever roll can enter race on rim of No. 4 cam (2, fig. 70). Aline pivot hole in lever with stud hole of bracket.

(207) Turn cams again until No. 4 cam is in position so offset in cam race will permit cam lever pivot stud (2, fig. 65) to enter cam race and drop into

position through cam lever pivot hole and stud hole in bracket.

(208) Tighten pivot stud setscrew, referred to in (170) above, on pivot stud setscrew seat.

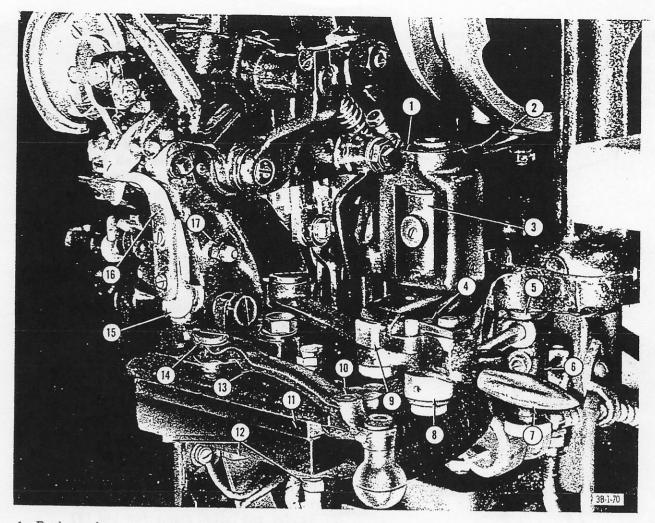
(209) Slip feed and guide handle retaining plate (10, fig. 65) into groove on feed and guide handle. Aline hole in plate with hole in handle, making certain end of plate is over lip of feed cam lever (4, fig. 70). Install retaining plate screw (9, fig. 65) through plate and into hole in handle.

(210) Slide feed ratchet rod (10, fig. 71) into top opening on side of swivel (4).

(211) Fit feed ratchet plunger (5) into hole in bottom of swivel, and slide plunger spring (6) into bottom of plunger.

(212) Tighten plunger locking screw (7) in bottom of swivel until neck of screw is visible in bottom hole on side of swivel.

(213) Tighten plunger locking screw retaining screw (11) in bottom hole in



- Feed cam lever
- Feed cam lever roll
- Feed cam lever bracket
- Feed and guide handle retaining plate Feed slide ratchet plunger swivel bearing screw
- Feed slide ratchet plunger swivel
- Feed and guide handle
- Feed slide ratchet rod
- Feed slide adjusting lever slide block

- Shoe guide shifter handle tension screw
- Feed slide retaining gib 11
- Feed slide retaining gib screws Shoe guide shifter handle
- Shoe guide shifter handle pivot stud
- Shoe guide bracket
- Shoe guide
- Shoe guide latch pin thumb nut

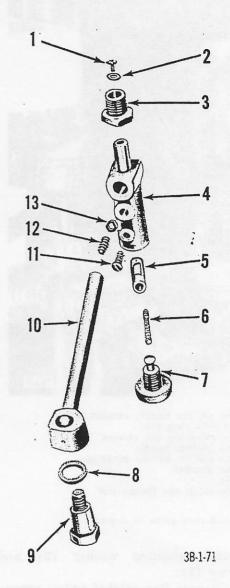
Figure 70. Feed cam lever, feed slide ratchet control, and shoe guide on frame.

side of swivel enough to touch neck of locking screw.

- (214) Tighten plunger retaining screw (72) in middle hole in side of swivel against seat of ratchet plunger, and install retaining screw nut (13) on retaining screw.
- (215) Place ratchet plunger swivel bearing screw (3) on top of swivel with thread of screw at top, and hold with

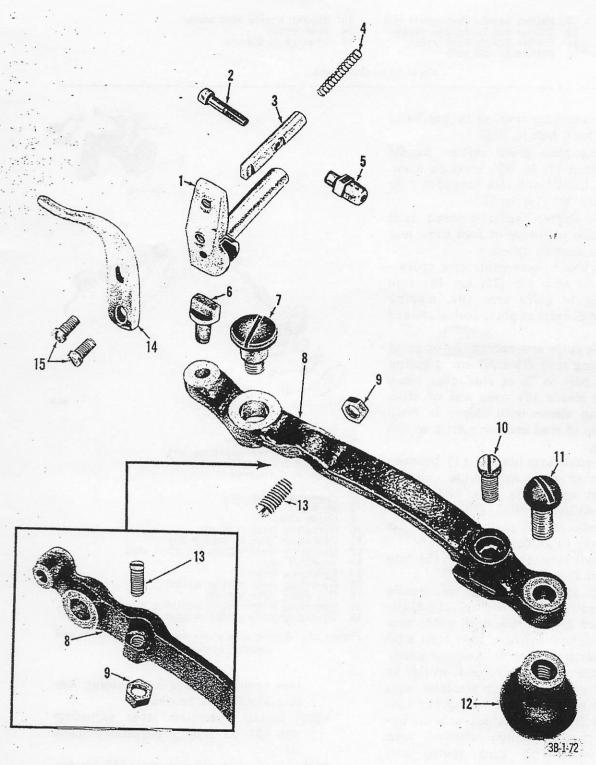
- swivel retaining washer (2) and screw (1).
- (216) Connect feed ratchet swivel assembly on stitcher head frame by installing swivel bearing screw into opening on frame under right camshaft column (5, fig. 70).
- (217) Place pivot end of feed ratchet rod underneath opening next to retaining plate in feed and guide handle (8, fig. 70).

(218) Slide ratchet rod stud retaining washer (8, fig. 71) on rod stud (9), and fit stud into hole from underneath to attach pivot end of rod to feed and guide handle.



- Swivel retaining washer screw
- Swivel retaining washer Plunger swivel bearing screw
- Swivel
- Plunger
- Plunger spring
- Plunger locking screw
- Rod stud retaining washer
- Rod stud
- 10 Rod
- Plunger locking screw retaining screw
- Plunger retaining screw Plunger retaining screwnut
- Figure 71. Feed slide ratchet control, exploded view.

- (219) Adjust feed slide by placing end of screwdriver on feed slide retaining gib (11, fig. 70), directly over right gib retaining screw (12) underneath frame, pressing gib firmly toward rear, and holding in position while tightening gib retaining screw. Repeat procedure for left and center retaining screws. Recheck all 3 gib retaining screws for firm tightening.
- (220) Slide shoe guide latch pin spring (4, fig. 72) into opening on front of feed slide (15, fig. 67), and fit shoe guide latch pin (3, fig. 72) into feed slide opening over spring.
- (221) Insert latch pin thumb nut screw (2) into opening in left side of feed slide and through hole in latch pin, and screw thumb nut (5) on extended end of thumb nut screw (17, fig. 70).
- (222) Install shoe guide (14, fig. 72) to bracket (1) with screws (15).
- (223) Place shifter handle knob screw (11) through hole in handle (8), and screw handle knob (12) on end of knob screw.
- (224) Screw shifter handle tension screw (10) into threaded hole of handle but do not tighten screw at this time.
- (225) Screw handle stop screw (13) into handle, and install stop screw nut (9) on screw.
- (226) Fit shifter handle pin (6) into hole at left end of handle.
- (227) Hold shifter handle in right hand and use left hand to place shoe guide bracket and shoe guide on handle pin, fitting lip on pin into channel on bracket.
- (228) Place shoe guide assembly on feed slide (16, fig. 70), inserting shoe guide bracket shaft into lower opening on front of feed slide. Slide shoe guide shifter handle on feed slide, making certain feed slide plate rides between forks of handle beneath tension screw (10).
- (229) Push shoe guide bracket into opening in feed slide, fitting end of shoe guide latch pin into slot on back of bracket. At the same time, push shoe guide handle toward rear of feed slide



- 1 Bracket
 2 Latch pin thumb nut screw
 3 Latch pin
 4 Latch pin spring

- 5 Latch pin thumb nut 6 Shifter handle pin 7 Shifter handle pivot stud 8 Shifter handle

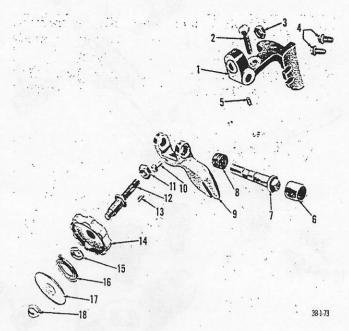
Figure 72. Shoe guide assembly, exploded view.

- Shifter handle stop screw nut
- 10 Shifter handle tension screw Shifter handle knob screw 11
- Shifter handle knob
- Shifter handle stop screw
 - Shoe guide Shoe guide screws

Figure 72-Continued.

until remaining opening in handle is alined with hole in slide.

- (230) Insert shoe guide shifter handle pivot stud (7, fig. 72) through opening in handle and into threaded hole on feed slide (14, fig. 70).
- (231) Slide shifter handle forward until it is flush with edge of feed slide, and tighten tension screw.
- (232) Tap bobbin case guide arm operating lever stop pin (10, fig. 73) into opening in guide arm (9), making certain flat side of pin is facing toward right.
- (233) Slide guide arm spring (8) on pivot adjusting stud (7) until end of spring fits in hole on lip of stud, then place spring sleeve (6) over end of stud, and tap sleeve until sleeve is flush with lip of stud and completely covers
- (234) Fit guide arm bracket (1) between prongs of guide arm, aline holes in bracket and guide arm, and install pivot adjusting stud, sliding stud to left until end of spring on stud fits into hole in guide arm.
- (235) Install pivot stud setscrew (5) into bracket from underneath.
- (236) With guide arm loose, use needle and awl wrench to turn pivot adjusting stud toward rear until guide arm is at highest position, then turn stud one-fourth turn more. Keeping steady pressure on stud to force it to left as far as possible, tighten setscrew with needle guide wrench. If spring tension will not keep guide arm in upward position, loosen setscrew, turn stud one-fourth turn more, tighten setscrew.
- (237) Screw operating lever adjusting nut (11) on adjustable pivot stud (12) until nut is against lip on stud.
- (238) Fit woodruff key (13) into key seat of pivot stud, and install end of stud



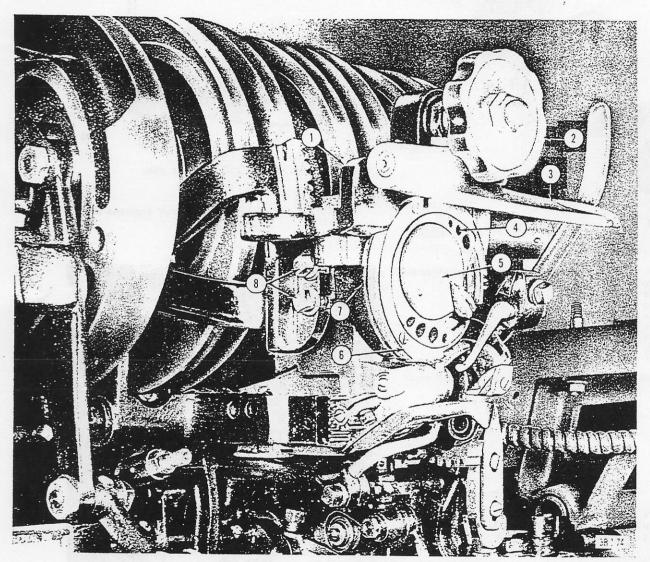
- Bracket
- Bracket brace screw
- Operating lever adjusting nut
- Bracket retaining screws
- Pivot stud setscrew
- Spring sleeve Pivot adjusting stud
- Spring
- Guide arm
- 10 Operating lever stop pin
- Operating lever adjusting nut
- Operating lever adjustable pivot stud Woodruff key 13
- 14 Operating lever
- 15 Operating lever spring washer
- 16 Operating lever spring
- Operating lever spring retaining plate
- Operating lever spring washer locking nut

Figure 73. Bobbin case guide arm operating lever and bracket, exploded view.

into opening in bracket, guiding key into keyway of bracket.

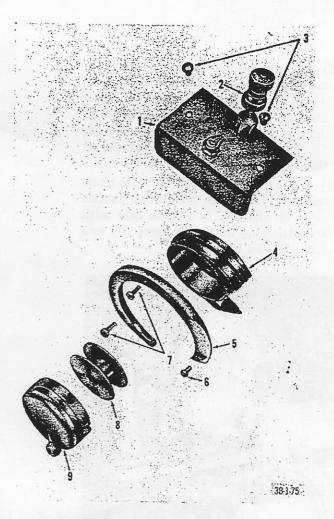
- (239) Install operating lever adjusting nut (3) on end of adjustable pivot stud.
- (240) Place operating lever (14) on opposite end of adjustable pivot stud and install spring washer (15), fitting slots on inside of washer on positioning pins and spring grooves on outside of washer at top (B, fig. 25).

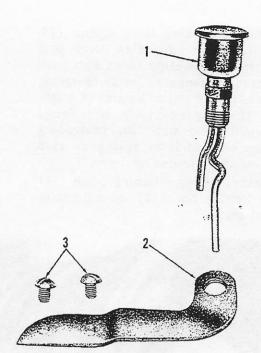
- (241) Place operating lever spring (16, fig. 73) over adjustable pivot stud and inside operating lever, and push protruding flange on inside of spring into left hand slot on outside of washer. If spring is too loose, move flange to right hand slot. Fit protruding flange on outside of spring on stud on inside of operating lever.
- (242) Install spring retaining plate (17) and locking nut (18) on adjustable pivot stud.
- (243) Install bobbin case guide arm bracket assembly on shuttle head, and insert guide arm bracket retaining screws (4) through openings in bracket into holes in shuttle head (8, fig. 74). Do not tighten screws at this time.
- (244) Place shuttle (4, fig. 75) into shuttle case (7, fig. 74), and install shuttle ring (5, fig. 75) to shuttle case with 2 shuttle ring flathead screws (7) and 1 roundhead screw (6).



- 1 Guide arm bracket
- 2 Operating lever
- 3 Guide arm
- 4 Shuttle
- 5 Bobbin case
- 6 Shuttle ring
- 7 Shuttle case
- 8 Bracket retaining screws

Figure 74. Bobbin case guide arm lever and bracket installed.





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- Shuttle driver and awl segment oiler
- Bracket
- 3 Bracket screws

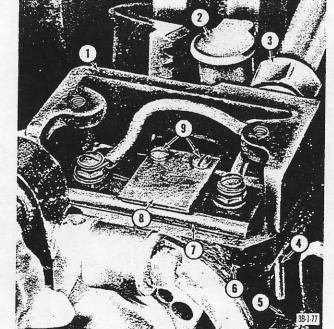
Figure 76. Shuttle driver and awl segment oiler, exploded view.

- Shuttle heat unit guard cover with oilcup, assembled Cam cover lock assembly Shuttle heat unit guard cover screws

- Shuttle Shuttle ring Shuttle ring roundhead screw Shuttle ring flathead screws

- Bobbin case assembly

Figure 75. Shutt'e with bobbin case, exploded view.



- Shuttle heat unit guard Shuttle driver and awl segment oiler
- Shuttle heat unit wiring conduit

- Shuttle heat unit wiring conduit
 Oil pipe for awl segment
 Awl segment
 Shuttle case
 Shuttle heat unit
 Shuttle heat unit clamp
 Shuttle heat unit clamp retaining screws

Figure 77. Shuttle driver and awl segment oiler with shuttle heat unit installed.

- (245) Place bobbin (8) into bobbin case assembly (9), and slide bobbin case into shuttle with horn on bobbin case facing down (5, fig. 74). Bring down bobbin case guide arm lever.
- (246) Slip shuttle driver and awl segment oiler assembly (1, fig. 76) into opening in bracket (2), being careful not to bend oil pipes of oiler. Screw oiler assembly into bracket as far as possible, making certain oilcup lid hinge faces toward rear.
- (247) Place bracket and oiler assembly on bobbin case guide arm bracket (1, fig. 74), alining holes in oiler bracket with holes at rear of guide arm bracket. Make certain end of short oil pipe on oiler assembly is in shuttle driver hole on top of shuttle head and end of long

- oil pipe is directly over awl segment (4, fig. 77).
- (248) Install bracket screws (3, fig. 76) through oiler bracket and into holes in bobbin case guide arm bracket.
- (249) Install shuttle heat unit clamp (8, fig. 77) to flat top of shuttle case (6) with 2 retaining screws (9), and handtighten screws.
- (250) Bring wiring conduit (3) up from rear with shuttle heat unit (7) and heat unit guard (1) and fit conduit between No. 2 and No. 3 cams.
- (251) Place shuttle heat unit guard, with heat unit and wiring, on top of shuttle case, slide heat unit under clamp, and tighten retaining screws referred to in step (249) above.
- (252) Aline hole in shuttle heat unit guard

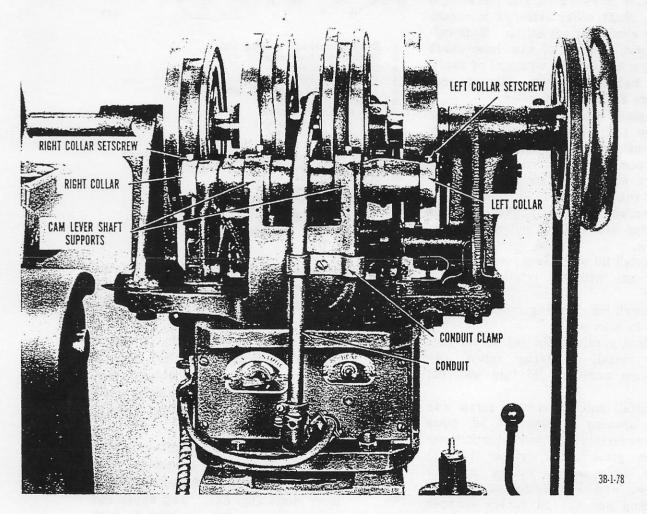


Figure 78. Cam lever shaft set collars installed on cam lever shaft.

(4, fig. 31) with hole in bobbin case guide arm bracket (1, fig. 74) and hole in shuttle case (7), and install bobbin case guide arm bracket brace screw (2, fig. 73) through holes.

(253) Tighten bobbin case guide arm bracket retaining screws referred to

in step (243) above.

(254) Place shuttle heat unit guard cover (1, fig. 75) on heat unit guard with end of oil pipe inserted into oilhole in flat top on front of shuttle case. and install shuttle heat unit guard cover screws (3) to hold cover to guard.

(255) Place clamp at rear of stitcher head frame over shuttle heat unit wiring conduit (fig. 78), and handtighten

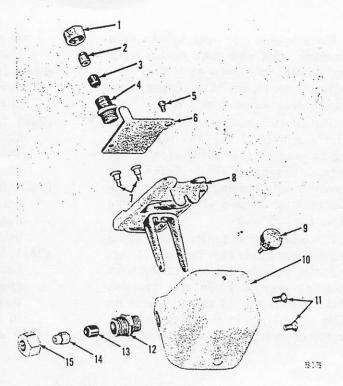
clamp screw.

(256) Refer to figure 78, and install cam lever shaft collar setscrew into cam lever shaft left set collar. Slide collar over left end of cam lever shaft until collar is flush with end of shaft, and tighten setscrew. Repeat procedure for right set collar.

- (257) Install wax pot rubber stripper screw (12, fig. 79) into opening on side of wax pot (10), place rubber stripper (13) in rubber stripper screw, place rubber stripper stud (14) over rubber stripper in rubber stripper screw, and install rubber stripper binding nut (15) on rubber stripper
- (258) Install lid with thread guide (8) to wax pot with lid retaining screws

(259) Install lid clamping screw (9) into hole in wax pot.

- (260) Place auxiliary lid (6) on lid (8), and install retaining screw through auxiliary lid into wax pot lid.
- (261) Install rubber stripper screw (4) into opening on wax pot lid, place rubber stripper (3) in rubber stripper screw, place rubber stripper stud (2) over stripper in rubber stripper screw, and install rubber stripper binding nut (1) on rubber stripper screw.



Rubber stripper binding nut

Rubber stripper stud

Rubber stripper

Rubber stripper screw Auxiliary lid retaining screw Auxiliary lid

Lid retaining screws Lid with thread guide Lid clamping screw

Wax pot

11 Wax pot-to-takeup bracket connecting screws

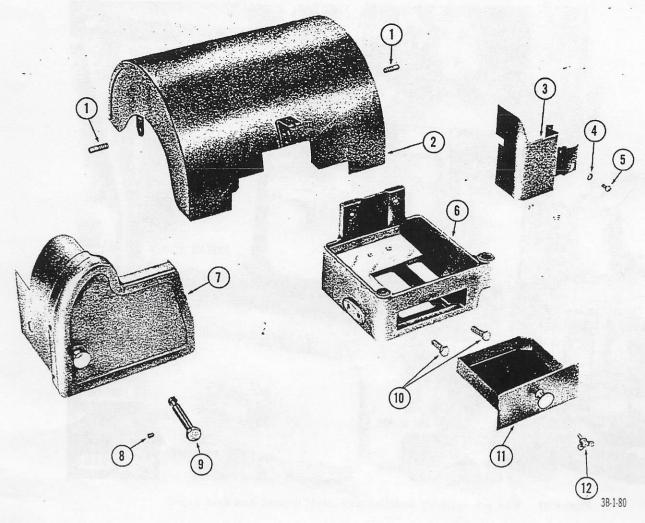
Rubber stripper screw

Rubber stripper 13 Rubber stripper stud

Rubber stripper binding nut

Figure 79. Stitcher wax pot and stripper, exploded view.

- (262) Install shelf bracket (6, fig. 80) on stitcher head frame with 2 shelf bracket screws (10) into frame (fig. 81).
- (263) Place wax pot assembly on auxiliary takeup bracket (fig. 81), and install wax pot-to-takeup bracket connecting screws (11, fig. 79) through openings in rear of takeup bracket into holes in wax pot.
- (264) Slip forks of presserfoot release treadle upper rod connector over opening in presserfoot-to-lock release lever shaft (fig. 82). Tap upper rod connector stud through holes in fork



- Cam cover pivot studs
- Cam cover
- Heat guard cover plate
- Heat guard cover plate retaining screw washer
- Heat guard cover plate retaining screw Shelf bracket

- Heat guard
- Heat guard pivot pin setscrew
- Heat guard pivot pin Shelf bracket screws 10
- Wax pot drip drawer
- Wax pot drip drawer retaining screw

Figure 80. Cam cover, shelf bracket, and heat guard.

of rod connector and hole in lever, and tighten stud.

- (265) Place heat guard cover plate (3, fig. 80) on right side of auxiliary takeup bracket over heat units, and install retaining screw (5) and washer (4) to hold plate to frame.
- (266) Place heat guard (7) on right hand side of shelf bracket (6), alining hole in heat guard with hole in shelf bracket, insert heat guard pivot pin (9) from underneath, through pivot pin hole in shelf bracket and into stud

hole of heat guard, and install heat guard pivot pin setscrew (8) on setscrew seat of pivot pin.

- (267) Slide wax pot drip drawer (11) into shelf bracket, and tighten retaining screw (12) in shelf bracket to hold drawer in place.
- (268) Slip cam cover (2) over cams, with brackets of cover alined with ends of cam lever shaft, insert cam cover pivot studs (1) through openings in cover brackets and into holes in end of cam lever shaft, and tighten studs.

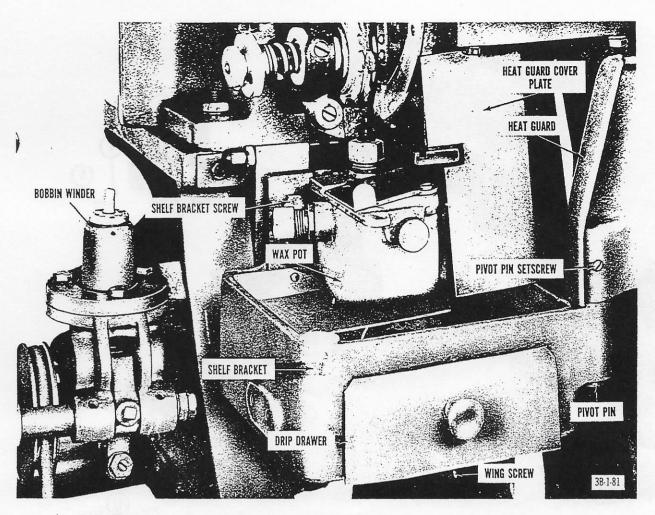


Figure 81. Wax pot assembly installed with shelf bracket and heat guard.

- (269) Connect assembled work light fixture by placing base of work light on top of cam cover and installing 2 screws through holes of base and into cam cover.
- (270) Loosen screw in wiring conduit clamp on back of stitcher head frame and place work light wiring conduit under clamp; tighten screw.
- (271) Install stitcher drive belt and bobbin winder drive belt (par 60d).
- (272) Swing cam cover to rear of head to have head free for installation of awl and needle and for final adjustments. Replace cam cover when

adjustments and tests are completed.

- b. Adjustments.
- (1) Install and adjust needle (par. 45)
 - (2) Install and adjust awl (par. 47).
 - (3) Adjust needle guide (par. 46).
 - (4) Adjust lifter (par. 48).
 - (5) Adjust looper (par. 49).
 - (6) Adjust auxiliary takeup lever and spring (par. 52).
 - (7) Check adjustment of presserfoot (par. 53).
- c. Run-in Test. The stitching machine should be given a thorough and complete inspection (par. 15) and run-in test (par. 17) with final adjustments.

· .

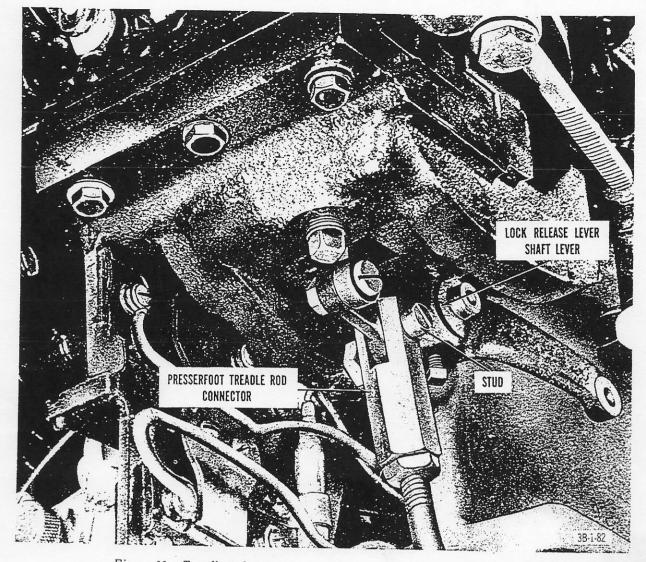


Figure 82. Treadle rod connector installed on lock release lever shaft lever

Section III. PRESSERFOOT RELEASE TREADLE ASSEMBLY

66. General

The presserfoot release treadle (par. 26) is connected to the head assembly by a connecting rod attached to the presserfoot-to-lock and tension release shaft lever (fig. 82).

67. Assembly Procedure

a. General. The presserfoot release treadle assembly is assembled as it is installed on the frame of the Model 12K-100 Special portable shoe repair unit.

- Bracket retaining nutsBracket washers
- 3 Pivot shaft
- 4 Bracket
- 5 Bracket retaining bolts
- 6 Pivot shaft setscrew
- 7 Treadle 8 Machine bolt
- 9 Spring

- 10 Squarehead setscrew
- 11 Upper rod connector stud
- 12 Upper rod connector
- 13 Upper rod connector locknut
- 14 Rod
- 15 Lower rod connector locknut
- 16 Lower rod connector pin cotter pins
- 17 Lower rod connector pin
- 18 Lower rod connector

Figure 83. Presserfoot release treadle assembly, exploded view.

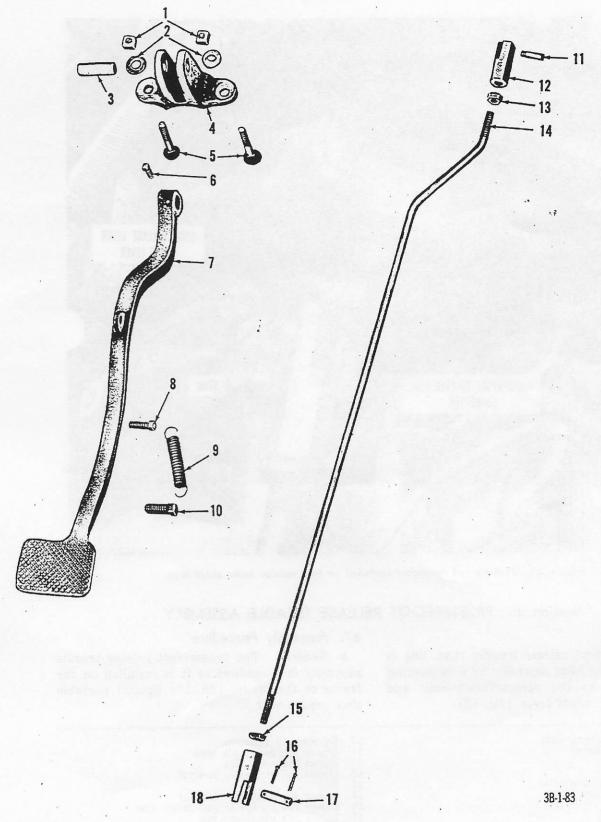


Figure 83—Continued.

- b. Method. The following steps indicate the method of assembling the presserfoot release treadle assembly.
 - (1) Connect presserfoot release treadle bracket (4, fig. 83) to wooden frame of stitcher-finisher machine (fig. 84), with bracket retaining bolts (5, fig. 83) installed up through holes in wooden frame. Install washers (2) and nuts (1) on bolts.
 - (2) Position treadle (7) between arms of bracket, install pivot shaft (3) to hold treadle to bracket, and install pivot shaft setscrew (6) in treadle end.
 - (3) Install machine bolt (8) into hole in side of release treadle, and square-head setscrew (10) into hole in stitcher stand above treadle, and attach spring (9) from bolt to setscrew (fig. 84).
- (4) Screw lower rod connector locknut (15, fig. 83) on rod (14) until 4 threads on rod show below locknut, and screw lower rod connector (18) on rod until connector touches locknut. Repeat procedure for upper rod connector locknut (13) and upper rod connector (12).
- (5) Slip forks of lower rod connector over protruding eye on top of treadle (fig. 84), install lower rod connector pin (17, fig. 83) to hold rod to treadle, and install cotter pins (16) in ends of pin.
- (6) Slip forks of upper rod connector over opening in presserfoot-to-lock release lever shaft lever (3, fig. 59), and install upper rod connector stud (11, fig. 83) to hold rod to lever (fig. 82).

Section IV. BOBBIN WINDER ASSEMBLY

68. Operation

The bobbin winder is turned from the drive shaft by a drive belt attached to an idler pulley. When the shifter lever is pulled forward, it presses the idler pulley against a driven pulley which rotates the shaft. When the shifter handle is pushed backward, it pulls the idler pulley from the driven pulley and, at the same time, moves a stop lever against the driven pulley.

69. Assembly Procedure

- a. General. The bobbin winder is completely assembled, with the exception of the drive belt, before being installed on the unit frame.
- b. Method. The following steps indicate the method of assembling the bobbin winder assembly.
 - (1) Insert bobbin winder pulley thrust plate steel ball (34, fig. 85) into opening of idler pulley thrust plate (33). Peen opening of thrust plate around ball to hold ball.
 - (2) Tap idler pulley bearing (29) into left side of idler pulley (27), with flat edge of bearing flush with opening of pulley.
 - (3) Tap idler pulley bearing (26) into

- right side of idler pulley, with flat edge of bearing flush with other opening of pulley.
- (4) Install idler pulley bearing setscrew (28) into setscrew hole of idler pulley.
- (5) Slide smooth end of idler pulley shaft (25) into idler pulley, and tap shaft lightly to left until shaft is flush with outside of pulley.
- (6) Slip idler pulley spring (30) into end of idler pulley shaft, install idler pulley pressure plug (31) in idler pulley spring, and place idler pulley pressure plug steel ball (32) in recess on pressure plug.
- (7) Install idler pulley thrust plate to end of idler pulley with thrust plate retaining screws (35).
- (8) Screw shifter handle knob (4) on shifter handle (5), insert end of handle into opening of lever (7), and screw shifter handle nut (36) on end of handle.
- (9) Place woodruff key (37) into key seat on shifter lever shaft (8), fit shaft into opening of shifter lever (7), guiding key into keyway until thread-

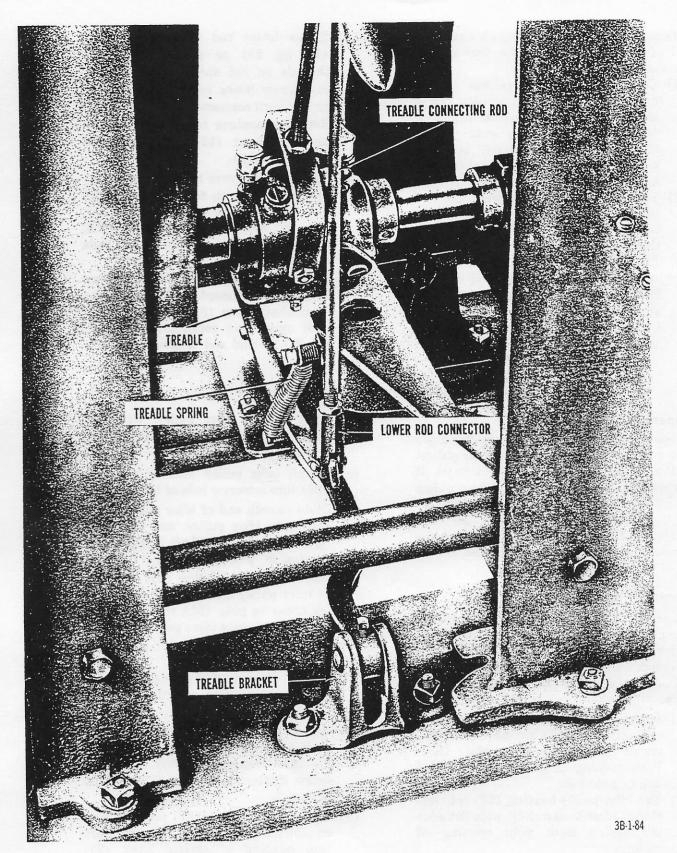
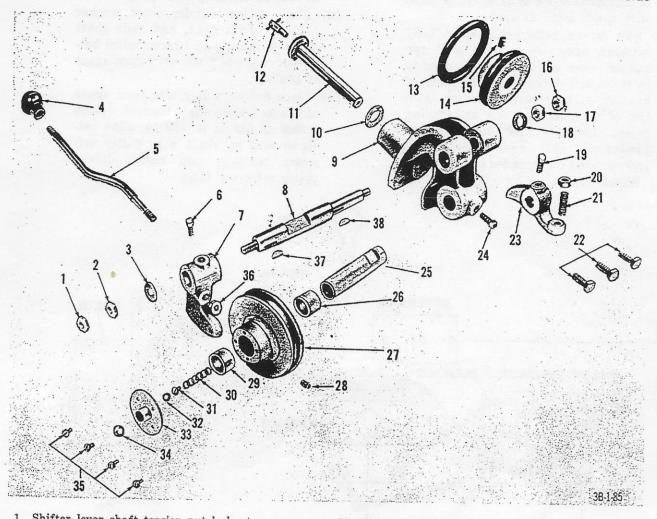


Figure 84. Presserfoot release treadle assembly installed.

ed end of shaft is exposed, and install washer (3), large tension nut (2), and tension nut locknut (1) on threaded end of shaft. Fingertighten nuts.

(10) Install shifter lever retaining screw

- (6), fingertight, into screw hole of shifter lever.
- (11) Fit idler pulley and shaft into rear opening of bracket (9) until shaft is flush at other end of opening, and screw seat on shaft faces hole in side



```
Shifter lever shaft tension nut locknut
Shifter lever shaft tension nut, large
                                                                                                  Driven pulley stop lever stop screw nut
                                                                                                  Driven pulley stop lever stop screw
Hexagon head machine bolts
      Shifter lever shaft tension nut washer
      Shifter handle knob
Shifter handle
                                                                                                 Driven pulley stop lever
Idler pulley shaft retaining screw
Idler pulley shaft
Idler pulley bearing
                                                                                           23
                                                                                           24
25
      Shifter lever retaining screw
Shifter lever
                                                                                           26
27
      Shifter lever shaft
                                                                                                 Idler pulley
      Bracket
                                                                                           28
                                                                                                 Idler pulley bearing setscrew
Idler puller bearing
10
      Shaft washer
      Shaft
                                                                                                 Idler pulley spring
Idler pulley pressure plug
      Shaft stud with bobbin winder drive pin
Driven pulley rubber tire
                                                                                                Idler pulley pressure plug steel ball
Idler pulley thrust plate
Idler pulley thrust plate steel ball
Idler pulley thrust plate steel ball
Idler pulley thrust plate retaining screws
      Driven pulley
      Driven pulley setscrew
Shifter lever shaft adjusting nut locknut
                                                                                           35
      Shifter lever shaft adjusting nut, large
                                                                                          36
                                                                                                 Shifter handle nut
      Shifter lever shaft adjusting nut washer
                                                                                                 Woodruff key
     Driven pulley stop lever retaining screw
                                                                                                 Woodruff key
```

Figure 85. Bobbin winder, exploded view.

- of bracket. Install idler pulley shaft retaining screw (24) in bracket, and tighten screw on screw seat of shaft.
- (12) Fit woodruff key (38) into key seat on shifter lever shaft, and fit lever and shaft into left arm of front opening of bracket until end of shaft is flush with inside edge of arm.
- (13) Slip driven pulley stop lever (23) between arms of bracket and tap shifter lever shaft through opening in lever and through second arm of bracket, making certain screw opening of lever is forward and facing down. Install washer (18), large adjusting nut (17), and adjusting nut locknut (16) on threaded end of shaft.
- (14) Install driven pulley stop lever re-

- taining screw (19) into top screw hole in driven pulley stop lever, and install stop lever stop screw (21) into other hole in stop lever. Install nut (20) on end of stop screw.
- (15) Slip driven pulley rubber tire (13) on rim of driven pulley (14).
- (16) Place bobbin winder shaft washer (10) on shaft (11), and slide shaft into top opening of bracket until bottom of shaft is flush with open space of bracket.
- (17) Place driven pulley into open space of bracket, slide shaft through driven pulley as far as it will go, aline setscrew seat on shaft with pulley setscrew opening, and install driven pulley setscrew (15).

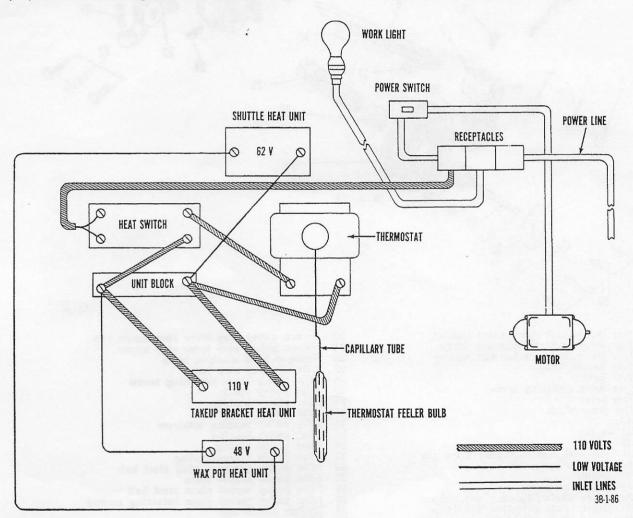


Figure 86. Wiring diagram.

(18) Install shaft stud (left-hand thread) with bobbin winder drive pin (12) into top of shaft.

(19) Place assembled bobbin winder (fig.

81) on stitcher head frame from below, and fit hexagon head machine bolts (22, fig. 85) into boltholes in stand.

Section V. HEATING SYSTEM

70. Description

a. The heating system of the sole stitching machine consists of three flat, conduction type heat units. One is attached to the shuttle head (fig. 77). The other 2 are attached to the auxiliary takeup bracket (fig. 32), 1 for bracket and thread rolls, and the other for the wax pot.

b. These heat units are thermostatically controlled (par. 20) and the wiring is connected in parallel to

in parallel to operate at 110 volts.

(1) The current for the takeup bracket heat unit (110 volts) passes through a manually operated starting switch to a unit block, then to the bracket unit, and finally to the thermostat to complete the circuit. (2) The current for the wax pot unit (48 volts) passes through the starting switch and then to the unit block. From the unit block the current goes to the wax pot heat unit and, bypassing the takeup bracket unit, to the shuttle heat unit, from which it returns to the unit block and then to the thermostat to complete the circuit.

71. Installation

Heating units, control panel, and thermostat are installed as prescribed by paragraph 65a(11) through (17) and (249) through (255). A wiring diagram appears as figure 86.

BOOK 2

FINISHING MACHINE

American Model L Landis, 100 Line, Model 102

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PART ONE INTRODUCTION

Section I. GENERAL

74. Scope

The instructions in book 2 apply to the Finishing Machine, American Model L and Landis. 100 Line. Model 102. The finishing machine contains the buffing, sanding, and trimming wheels which dress the shoe in the final stage of the shoe repair operation.

- a. Part two contains information on the operation of the finishing machine with a description of its controls and instruments.
- b. Part three contains information for the guidance of personnel of using organizations responsible for the first and second echelon maintenance of the finishing machine. It contains information needed for the performance of the scheduled lubrication and preventive maintenance services. Paragraphs 110 through 125 are devoted to second echelon maintenance and adjustment of the various assemblies and major units comprising the Landis. 100 Line, Model 102 and the American Model L Finishing Machines. These sections contain short descriptions of components of the systems in the machine and explanations of their functioning and interrelationship. Only the maintenance which the unit mechanic of the using organization is authorized to perform is included in these sections. The components of the finishing machine are relatively simple in construction and operation, and the unit mechanic of the using organization may repair any assembly of the finishing machine except the motor.

75. Records

- a. WD AGO FORM 460 (PREVENTIVE MAINTENANCE ROSTER). The parts of this form which apply to stitching machines may be maintained to record the lubrication of this equipment as described in paragraphs 102 and 103.
- b. WD AGO FORM 468 (Unsatisfactory Equipment Report). This form will be used to

report defects in the manufacturing, design, or operation of machines, assemblies, or parts. The same form will be used to report complaints on the lubricants and preserving materials used in the machines. When so used, the form will contain identifying details of the products and the machinery on which they are used.

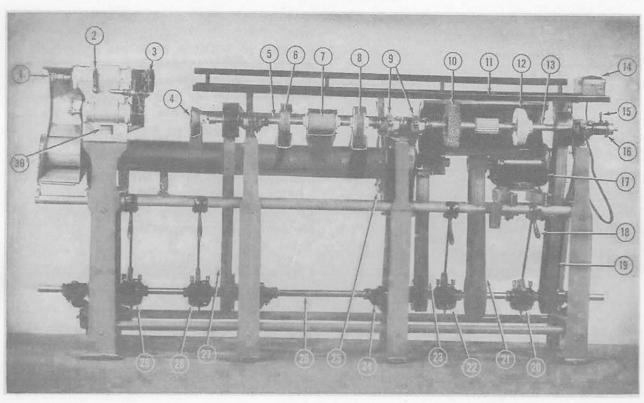
76. Orientation

Throughout this book, the terms FRONT, REAR, LEFT, and RIGHT are used as the operator would use them when standing at the controls of the machine in the operating position.

Section II. DESCRIPTION AND DATA

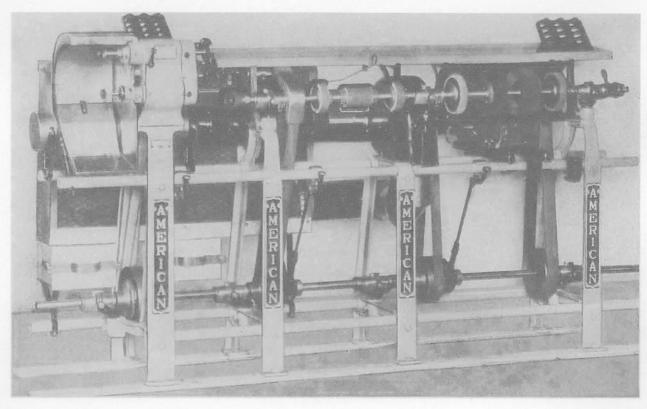
77. Description

- a. General. In the finishing machine (fig. 129), the power shaft runs through the length of the base of the machine. The upper shaft carries the operating wheels. The edge trimmer, stitch picker, and cutter grinder are mounted as a unit in the end of the machine frame but are driven by the power shaft. In the Landis portable shoe repair unit Model 12 K–100 Special (fig. 131), the finishing machine is mounted on a common frame with the stitcher unit. These machines are powered by a 1½-horsepower electric motor.
- b. IDENTIFICATION INFORMATION. The operator should be able to identify the manufacturer, model, and serial number of his machine. This information is especially important in the requisitioning of replacement parts. On the American Model L (fig. 130) and the Landis, 100 Line, Model 102 (fig. 129) the name of the manufacturer appears on all of the four front frame legs. On both machines an identification plate appears at the top of the front leg beneath the edge trimmer. The finisher in the Landis portable shoe repair unit Model 12 K–100 Special (fig. 131) will be designated by that model and number.



Ref. No.	onienclat"re	Ref. 1Vo.	Nomenclalure
1	Edge trimmer.	16	Edge etter.
2	Brake lever.	17	Motor.
3	Cutter grinder.	18	Clutch control handle.
4	Heel breaster.	19	Burnisher shaft drive belt.
5	Sander shaft.	20	Bumi her shaft clutch.
6	Heel sander.	21	Power haft drive belt.
7	Bottom sander.	22	Blower clutch.
8	Heel sander.	23	Bloi,er drive belt.
9	Sander and burni her shaft bearings.	24	Power shaft bearing.
10	Fini hiog bru h.	25	Blower.
11	Shelf.	26	Power shaft.
12	Burnishing ·wheel.	27	Sander shaft drive belt.
13	Burnisher shaft.	28	Sander shaft clutch.
14	Power switch.	29	Edge trimmer clutch.
15	Edge setter heat control handle.	30	Edge trimmer dri, e belt.

Figure 129. Landis, 100 Lille, model 102 finishing machine.



FigHre 130. American model L finishing 111, aclzine.

c. DIFFEREN ES IN MODELS. For operational purpose, the American Model L finisher and the Landis. 100 Line, Model 102 finisher may be con-sidered ali ke. For maintenance purposes, the two models differ only in clutch design. (See par. 110.) Minor differences in the structural detail of these models are apparent in figures 129 and 130.

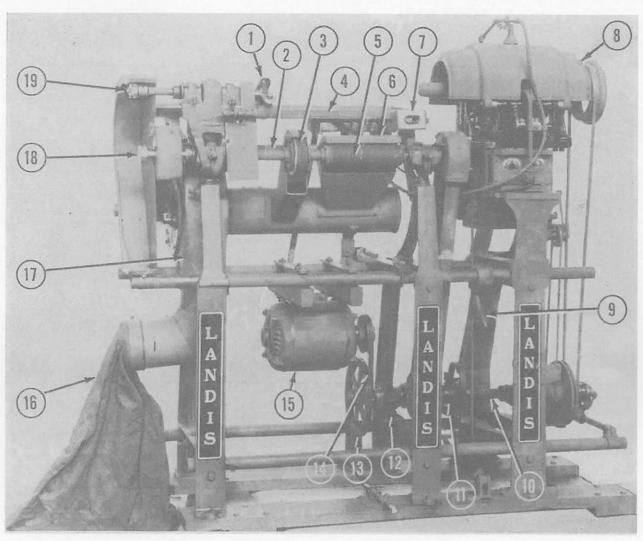
78. Tabulated Data

 $\it a$. FINISHER SPECIFICATIO -s, LANDIS, MODEL, PACKAGED.

Dimensions (in.)		Weight (lb.)			
Length	Width	Height	Gross	Net	Dust collector
105	25	60	1,340	775	42

b. MOTOR SPECIFICATIONS.

Horsepower	1.5
Phase	Single
Cycles.	. 60
Volts	110-220
Revolutions per minute	.750



Ref. No.	Nomenclature	Ref. No.	Nome liciat live
1	Cutter grinder.	11	Clutch.
2	Finishing shaft.	12	Power shaft bearing.
3 .	Heel sander.	13	Drive pulley.
4	Shelf.	14	Power drive belt.
5	Bottom sander.	15	Motor.
. 6	Bottom sander hood.	16	Dust collector.
7	Power switch.	17	Blower.
8	Landis 12 K sole- titching unit.	18	Edge setter.
9	Clutch control handle.	19	Edge trimmer.
10	Power shaft.		

Figure 131. Lal1dis portable shoe repair unit, Model 12 K-100 Special.

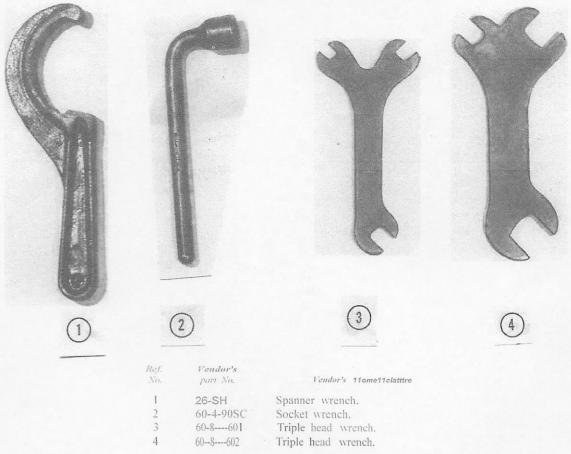


Figure 132. Tools.

Section III. TOOLS AND ACCESSORIES

79. Tools

The American and Landis models of finishing ma-chines are supplied \\.\text{-ith the tools shown in figure 132.}

80. Supplies

a. The following standard supplies are issued with the finishing machine:

Description	Quantity
Finisher oil	1 quart
F. S. sandpaper	18 cover
I-lee] breaster sandpaper	3 sheet
9 by 11 sandpaper	3 sheets
No. 6 burnisher covers	4
Grinding wheel, 60-2-12	1

b. For additional supplies issued to the using organization, see paragraph 101.

81. Accessories

In addit iou to the standard tools and supplies the following accessories are supplied with each model:

Description	Quantity
No. I stag belt hook	3
i-inch black iron washers	8
2Y, by 74-inch leather belt	1
Yi! by 2-inch machine belts (60-6-303A)	4

PART TWO

OPERATING INSTRUCTIONS

Section IV. SERVICE UPON RECEIPT OF EQUIPMENT

82. New Equipmen t

- a INSPECTION FOR DAMAGE IN HIP)fE T. Since the machine will be well protected for shipment, there is only a small chance of its being damaged. Frame and frame part are mo t likely to be injured. Inspect frame leg and cross member for cracked or broken parts. Tighten all bolts. screw, and nuts that have loosened in handling and transportation.
- b RKMOVAL OF CORROSION-PREVENTIVE MATE-RIAL. Part of the machine unprotected by paint

should arriYe covered with a heavy lubricant. A mixture of Diesel fuel and machine oil containing not more than 15 percent machine oil serves well as a cleaning solution. Remove corrosion-preventive material with cleaning solution and a brush or coarse cloth.

- c. IKSTALLATION. (1) Mode[102 and Mode[L (figs. 129 and 130). (a) Examine flooring upon which the fini her is to be placed. If it is weak or unstable, brace or reinforce it. Each leg of the finisher must re t on a solid ba e and must be firmly secured. If floor is uneven. level the machine with wooden shingles or metal shims and fasten legs to floor with lag screws furnished for that purpo e.
- (b) When legs are secured, align the shafting. Shafts must be aligned correctly to prevent bearings from heating and sticking. MoreoYer, a poorly aligned shaft requires an excessiYe amount of power and will be a constant maintenance problem. Align main shaft (power shaft) first. Proper horizontal alignment can be determined by stretching a tring from one leg of the frame to the other. Measured distance between the shaft and the string hould be equal at all points. The shaft can best be aligned vertically by placing a spirit level on the top of the shaft. V/hen the shaft is properly aligned, it will turn freely by hand when the belts are off.

- (c) Align the upper haft in the manner de-scribed in (b) above. when properly aligned, it should parallel the main shaft at all point. After the shafts are aligned put on the belt.
- (d) The finisher countershaft (main shaft) should run at 850 reYolutions per minute. The revolutions per minute of the motor will determine the diameter of the motor pulley required to run the main shaft. The following schedule will fit mot machines:

:Motor speed	Motor pulley diameter
(r.p.m.)	(in.)
1,750 to 1,800	4
1,450 to 1,500	5
1,100 to 1,200	6

- (2) Landis portable shoe repair 1 in.it, llodel 12 K-100 Special (fig. 131). The unit i in talled by unloading it from the repair trailer and setting it on some level ba e. (See book 5.) Align power shaft of unit and upper shaft of finisher.
- d. RuN-I TEST. (1) Lubricate machine a prescribed in paragraphs 102 and 103.
- (2) Connect electric motor with a power circuit (220-volt line is preferable). Move witch to ON.
- (3) Engage clutches one at a time by raising the clutch leYer handle. Check the alignment and clearing of the belt. The main haft and upper shaft hould turn freely without apparent end play or Yibration. vVhen edge trimmer clutch i encraged, the edge trimmer should start smoothly and nm quietly.
- (4) Run the machine until shaft and bearings appear to have worked in smoothly. Stop the machine. Remove belts. Shaft should turn freely by hand. Bearings should be cool. Check to see that bearing, clutches, and all nuts and screws are secure. If machine is fotJ.nd to be in satisfactory operating condition, replace belts.

83. Used Equipment

ervices performed upon the receipt of used equipment are the same as those described for new equip-

ment in paragraph 82. In addition, bearings, clutch facings, and cutter head should be checked for evidence of excessive wear.

Section V. CONTROLS AND INSTRUMENTS

84. Power Switch

The power switch may be located on the motor or on the front of the shelf of the finisher. (See 14, fig. 129.) \\Then power is furnished by a generator, the switch is effective only when the generator is operating.

85. Clutches

- a LANDIS PORTABLE SHOE REPAIR UNIT MODEL 12 K-100 SPECIAL. In this model the finisher has a single clutch control. (See 9, fig. 131.) Lift the handle to engage clutch. Lower the handle to dis-engage clutch.
- h AMERICAN MODEL L. On the American Model L finisher (fig. 130), the blower, the upper shafts, and the edge trimmer unit have each a clutch control. Engage and disengage clutch as described in *a* above.
- c LANDIS, 100 LINE, MonEL 102. On this model (fig. 129), the blower, the burnisher shaft, the sander shaft, and the edge trimmer unit each have a clutch control. Engage and disengage clutch as described in a above.

86. Edge Trimmer Brake

The edge trimmer brake is located in the center of the face of the edge trimmer unit. (See 1, fig. 129.) To stop the motion of the trimmer head after clutch has been disengaged, move brake handle to the left.

87. Edge Setter Friction Heater Control

The edge-setting irons are heated by a friction heater containing an asbestos friction element. The heater has two heating positions. When the control handle (15, fig. 129) is toward the rear, the heater may be left on continuously without overheating. To heat the edge setter quickly, the handle is moved toward the front. In this position the edge setter will overheat in a short time. When the heat control handle is at center between the forward and rear positions, it is at neutral and the heater does not generate heat.

Section VI. OPERATION UNDER USUAL CONDITIONS

88. General

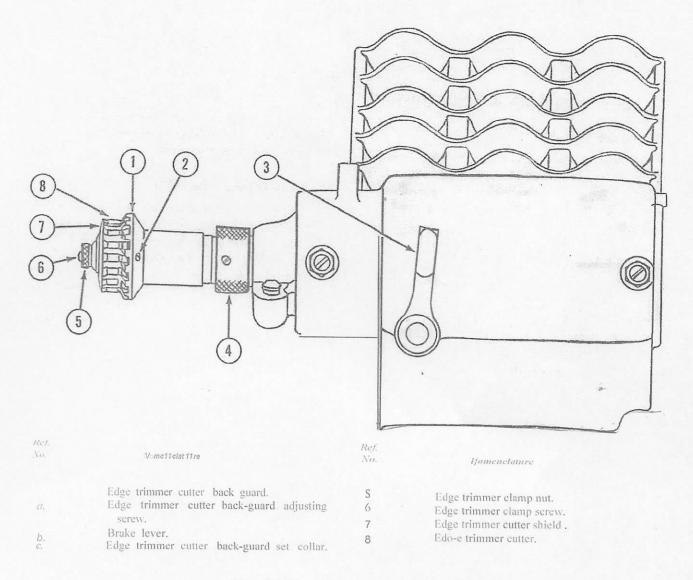
Operation of the finisher is a relatively simple process. The shoe is applied to the various oper-ating wheels of the finisher in succession, until it is trimmed, sanded, and polished.

89. Edge Trimmer (fig. 133)

- a 0PERATI0 Trimming the edges of the sole of the shoe is the first of the finishing operations. The edge trimmer cutter blades rotate at high speed. The sharp blades trim the edge of the sole of the shoe until the edge has a smooth finish. The operator grasps the upper of the shoe in the left hand and holds the heel of the shoe in the rigl;t hand. The sole of the shoe should be perpendicular to the floor. Hold the shoe directly under the cutter, and guide from one end around the toe and back around on the other ide of the shoe.
- h REPLACENENT. (1) Removal. Release clamp nut. (See 5, fig. 133.) Hold the edge trimmer shaft with the brake lever (3) or by grasping the knurled back guard set collar (4) with the right hand. With the left hand turn the back guard (1) so that the top of it turns toward the operator. v\Then the clamp nut (S) js released, remove cutter (8) and cutter shield (7) with fingers. Mo t trouble in removing cutters is caused by the cutters fitting too tightly on the shaft. If cutters do not turn on the shaft, it will be difficult to remove the clamp nut (S).
- (2) Installation. Place cutter (8) on end of shaft. If it will not turn on shaft, remove and examine it for burs. If burs are found, remove them with sandpaper. If all cutters fit tightly and are not burred, polish the shaft slightly with sandpaper until cutters will turn on shaft. When the cutter fits properly on the shaft, push it onto shaft as far as it will go. Place cutter shield (7) on shaft. Tighten clamp nut ("S) by holding the back guard set collar with one hand and turning top of cutter away from operator. The cutter back guard (1) should be set so that the face of the guard is even with the inside level of the cutter (8). This adjustment is made with the back guard adjusting screw.

90. Heel Breaster (fig. 134)

a OPERATION. The heel breaster (1, fig. 134) is a revolving, conical sand wheel which is used to



Fi'gur.e 133. Edge trill ll ller entler replace ll lel lt.

grind an even finish out of the breast of the heel (2) and the heel base of the shoe. The operator grasps the heel and quarter of the shoe with the right hand and holds the vamp and outsole of the shoe with the left hand. The shank of the shoe is held flat again t the face of the heel breaster wheel.

b REPLACEMENT OF SA D PAPER. Place pin wrench in pinhole (3) of shaft connection (4). Loosen shaft connection by turnino- top of it down toward the operator. Turn it until sand paper on heel breaster (1) is loose. Remove paper. Place new paper on heel brea ter so that the upper flap of the paper passes up around the top of the heel breaster and points to the rear. Turn top of haft connection (4) down and toward the rear until paper is held securely on heel breaster. Pressure of the heel breaster as it turns against the shoe will

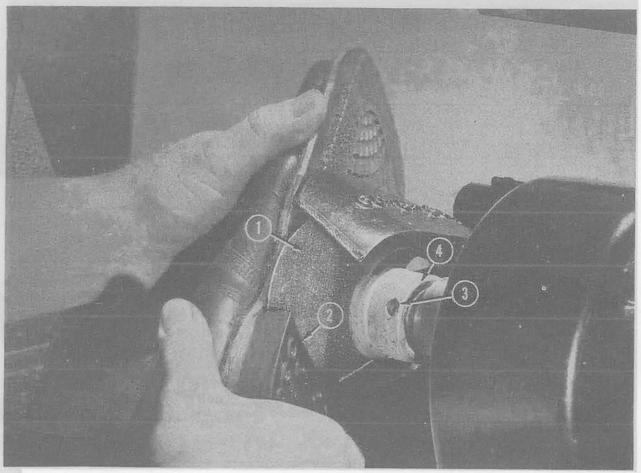
tighten the shaft connection adequately.

base of the shoe are evenly fin is hed.

91. Heel Sander

a. OPERATION. The heel and r (fig: 135) is a revolving sand whee I which sands the heel of the shoe clown to a smooth, even fini h. Grasp shoe with right thumb against heel breast of hoe and with fingers along the bottom of the heel. Point toe of .shoe forward toward the operator. Guide shoe with left hand grasping quarter of the shoe. Turn the heel of the shoe against heel sander until the heel and he I

b. REPLACEMENT OF P APER. (1) Removal (fig. 136). vVhen paper becomes o worn that it is no longer effective, it should be replaced promptly so that the wood and felt of the sanding wheel are not damaged. Raise the hood of the heel sander (3,



Ref.
No.
Nomenclature

Heel breaster.
Heel breast.
Shaft connection pinhole.
Shaft connection.
Fig1Jre 134. Heel breaster.

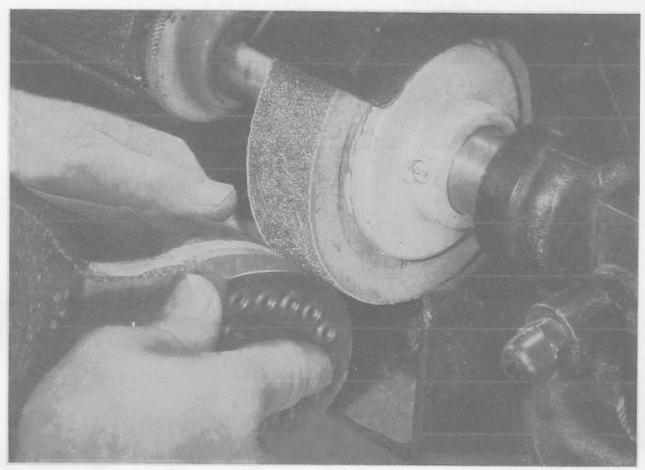


Figure 135. Heel sander operation.

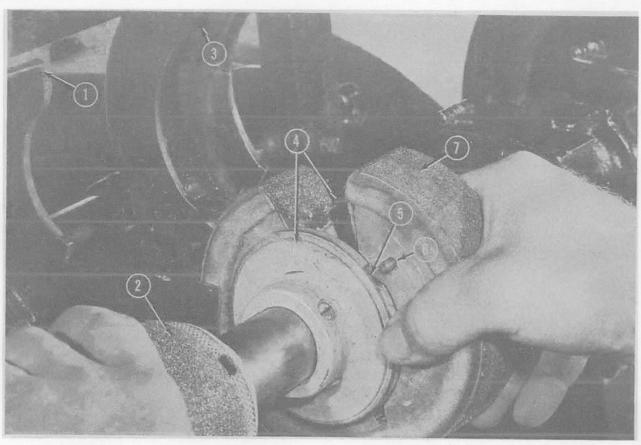
fig. 136) and the hood of the bottom sander (1). Turn upper shaft by hand until the opening joint of the heel sander is turned up and is facing the oper- ator. Grasp bottom sander (2) with left hand to hold shaft securely. VVith right hand strike down- ward on lower segment of heel sander (7) to open segments in direction that shaft turns. When seg- ment are loose in the collars (4) turn segments until segment pin (6) in segment coincides with notch (5) in collar. Lift segment up until the work(ng space between the open ends of the seg- ments is sufficient to remove paper. Lift ends of paper off the paper-retaining pin (1, 2, fig. 137) and remove paper from sanding wheel.

(2). Installation .(fig. 137). Segments of the wheel should not be opened more than 2 inches when paper is being installed. If wheel is opened more than 2 inches and the paper is placed in position on the paper-retaining pins (1 and 2, fig. 137) the paper will be stretched too tight when the wheel is closed and will break down the corners of the segments.

Place one end of the new paper on the paper-retaining pins of the top segment of the wheel. Pass paper over the top of the wheel and down and up around the bottom segment. Fasten loose end of paper on retaining pin (2) in the bottom segment. Turn wheel in collars until segment pin (4) drops into notch (3) in wheel collar (5). Close wheel. Turn top of wheel to the rear and down until it is tight in the collars. Turning wheel to the rear secures it in the collars by turning segment pin into an eccentric groove on the inside of collar.

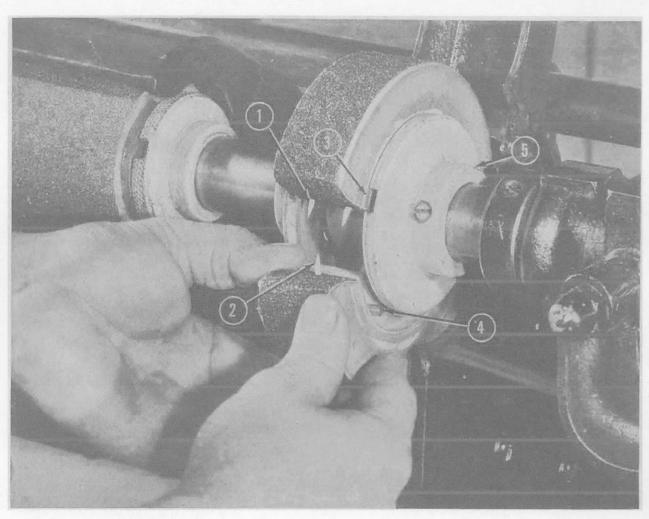
92. Bottom Sander

a. OPERATION. The bottom sander (fig. 138) is a revolving-drum sand wheel which sands down and finishes the shank of a leather soled shoe. Grasp the quarter of the shoe with right hand. Place toe of shoe toward the floor and shank of shoe toward sander. Guide shoe with left hand along the vamp of left side of shoe, holding shank of shoe upon sander.



Ref. No.	Nomenclat1.,re
1	Bottom sander hood.
2	Bottom sander.
3	Heel sander hood.
4	Sanding-wheel collars.
5	Retaining notch.
6	Segment pin.
7	Lower segment.

FigHre 136. RemolJal of heel sander paper.



Rrf. ,\"o.	Nomenclatu re
1	Upper segment paper-retaining pins.
2	Lower segment paper-retaining pin.
3	Retaining notch in collar.
4	Segment pin.
5	Collar.

Figure 137. Installation of he,!![sander pa.per.

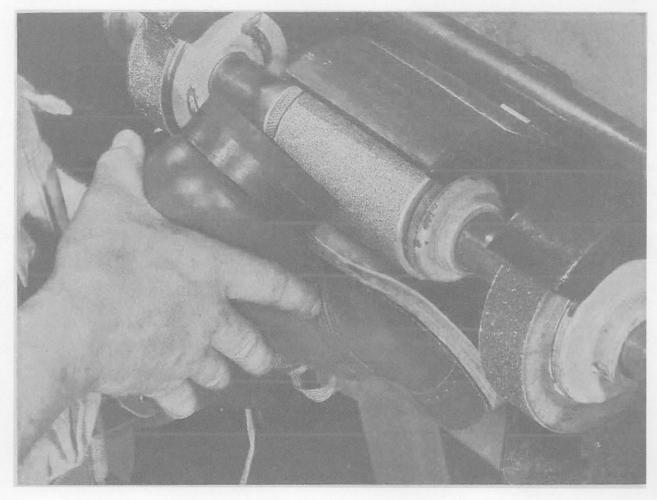


Figure 138. Bot/0111 sal1dcr opcratio11.

c. REPLACE:HEXT OF PAPER. Follow procedure de cribed in paragraph 91b for Landis, 100 Line, Model 102.

93. Finishing Brush

a. OPERATION. Ink i applied to the part of the shoe that require it. The shoe i then held against the revolving finishing bru h (fig. 139) until it is dry and polished.

b. REPLACEMENT. See paragraph 120.

94. Burnisher Wheel

a. OPERATIO The burni her wheel is a cloth covered wheel which rotates with the upper shaft. After burni, hing wax i applied to the cloth cover of the wheel, the operator buffs and waxes the edges of the hoe against the rotating wheel.

b. REPLACEME TT. (1) U e spanner wrench (3, fig. 140) to release retaining collar (2) at side of burnisher wheel. Turn top of collar forward and down. nwrap burnishing cloth (1, fig. 140) from wheel, lifting binding cord (1, fig. 141) free of notch in wheel in which it was anchored.

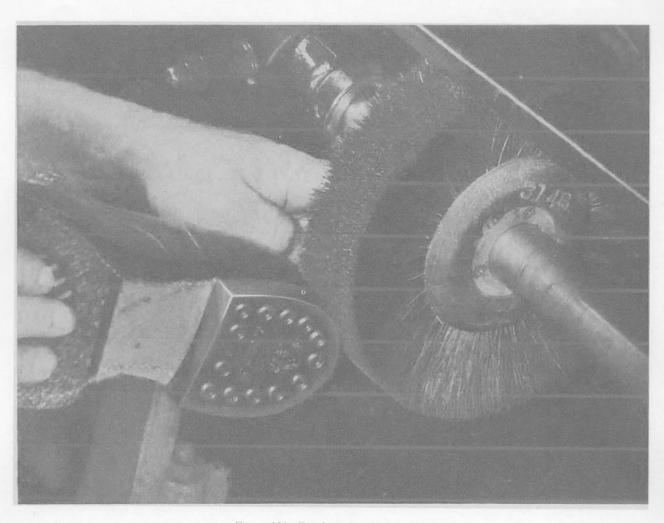
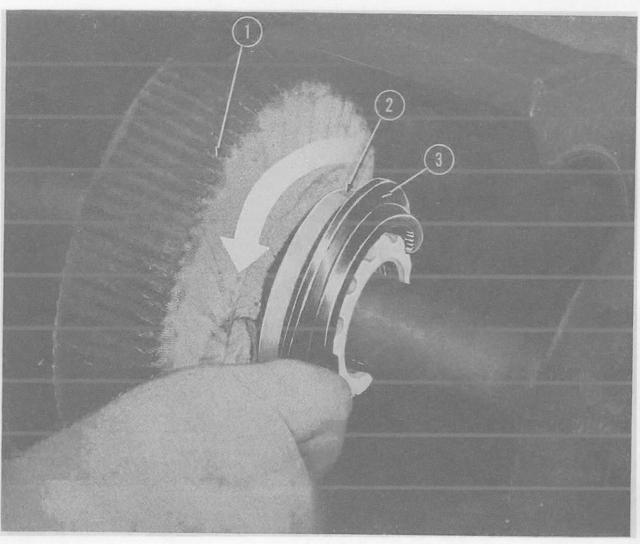


Figure 139. Finishing brnsh operation.



Ref.
No.

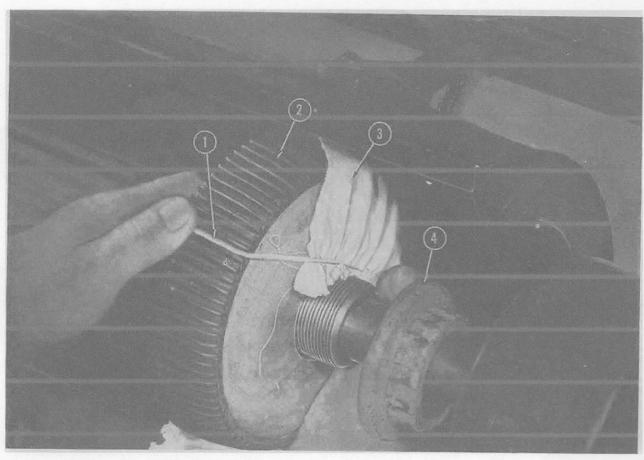
1'./ome-n,c/atu1-e

Burnishing cloth.

Clothoretaining collar.

Spanner wrench.

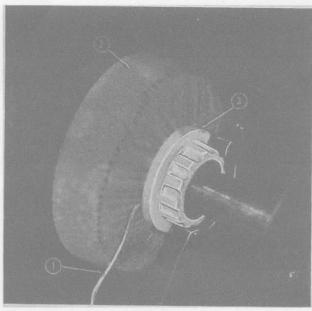
Figure 140. Removing biirnishing cloth.



Ref. No.	1Vomencfature
1	Binding cord.
2	Burnishing wheel.
3	Burnishing cloth.
4	Cloth-retaining collar.

Figure 141. Appl-:ying bl1mishi11g cloth.

(2) Place new burnishing cloth (3, fig. 141) on wheel. Anchor binding cord (1, fig. 141) in notch in wheel. Pass cloth over the top of the wheel and down behind it. Bring loo e end of cloth up around front of wheel so that when cloth laps on the wheel, the lap will point to the rear when lap is at top of wheel. Turn retaining collar (2, fig. 140) up against wheel so that burnishing cloth and binding cord are secured. (See fig. 142.) Tighten retaining collar (2, fig. 142) with spanner wrench (3, fig. 142) by turning top of colJar to the rear. Cut free encl of binding cord close to retaining collar.



Ref.	
No.	J\T011ienclature
1	B'inding cord.
2	Burnishing cloth.
3	Cloth-retaining collar.

Figure 142. Secu, ring burnishing cloth.

(3) When burnish r wheel is in motion, apply burnishing wax to the covered burnisher wheel. (See fig. 143.)

95. Edge Setter (fig. 144)

a. OPERATION. The rotating, friction heated edge setter (1, fig. 144) applies hot wax to the edges of the soles of the shoe to darken and waterproof them. The edge etter is heated by the friction created against an asbestos friction element, the heat being controlled by the heat control handle (2). When the handle is straight up, the friction element is in

neutral and no heat is generated. Pushing the con-trol handle to the rear places the heater in operating position. In thi position the heater will generate enough heat for proper operation and will not overheat under continuous use. To warm the friction heater quickly, pull the control handle (2) forward. This po ition should be held only until proper oper- ating temperature is reached and then the handle should be pushed to the rear. The friction element will overheat if control handle is left in forward position too long. When the edge setter (1) is at the proper operating temperature, grasp the shoe with both hands and press edges of sole of shoe against the rotating edge setter. Hold shoe in such a way that fingers cannot slip against the whirling edge etter. Turn shoe until entire edge of the sole

evenly finished.

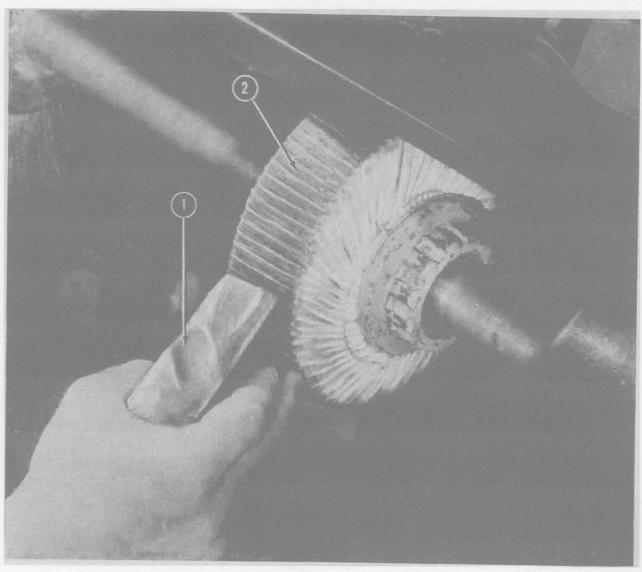
b. REPLACEMENT. (1) Removal. Set heat control handle (2, fig. 144) in neutral (straight up) and pres heat control unit away from edge setter (1) afar as it will go. Grasp edge setter (1) and turn it forward and down until eccentric groove within it is releated from pin on haft. As edge setter i turned, pull it toward outward end of shaft. When notch on side of edge etter coincides with pin on shaft, edge setter will slide off encl of shaft.

(2) Installation. Place edge setter (1, fig. 144) raised side inward, ag ainst outward encl of shaft and then turn to the rear and clown. vvhen notch in ide of edge setter coincides with pin on shaft. edge setter will slide into place on shaft. Continue to turn edge setter until it is tight on the shaft. Press heat control handle (2) toward edge setter until it is snug against it. Press heat control handle to rear and then return it to neutral position to be sure friction element is in contact with edge setter which will become tighter in use as it turns against the shoe pressed against it.

Section VII. OPERATION UNDER UNUSUAL CONDITIONS

96. General

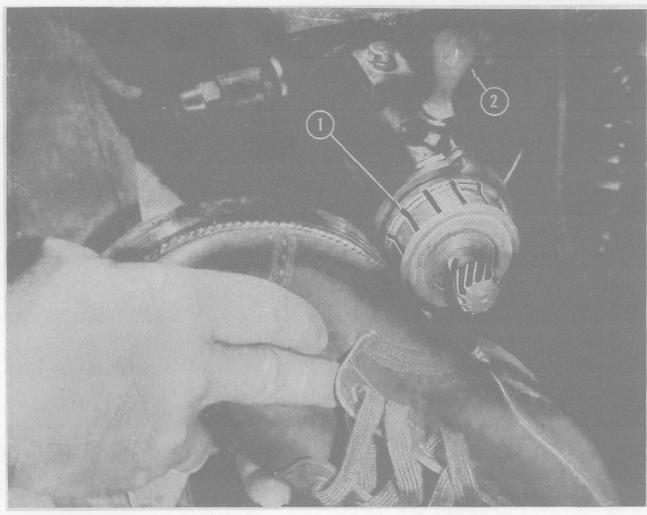
The simple, straight line construction and operation of the finishing machine make it relatively un-affected by any extremes in humidity or tempera- ture that" the operator could endure.



Ref.
No.
Nomenclatut'e

Burn ishing wax.
Burnisher wheel.

Figure 143. vVaxing burnisher wheel.



Ref.
No.
NonI,e,I,c/ature

Edge setter.
2 Heat control handle.

Fignre 144. Edge setter operation.

97. Operation under Extremely Dusty or Dirty Conditions

Where the air is extreme ly dusty or the terrain very muddy, some precautions should be taken in the operation of the finisher. Shoes should be free of all removable dirt before they are accepted in the shoe repair installation. If this precaution is not feasible, clean all dirty shoes before they enter the shoe repair process. Dirt and grit are especially damaging to the edge trimmer cutter and the fin isher bearings. Check oil reservoirs at each lubricating period to ee that they are not clogged and are feeding oil to their bearings. Lubricate

more often than prescribed in paragraphs 102 and 103 if dust and dirt become so prevalent as to increase fr iction in bearings.

Section VIII. DEMOLITION TO PREVENT ENEMY USE

98. General

In a theater of war, where control of ter ritory may change hands swiftly, it is necessary for the organization using this equipment to know how to demolish it quick)y if its capture is imminent.

99. Procedures

a. REMOVAL. Every attempt should be made to move this equipment into a safe position. If re-moval is impossible, the finisher and its supplies must be so thoroughly demolished that nothing will be useful to the enemy.

b. DE TRUCTION. Use an ax or ledge to sma h motor, clutches, finishing wheels, shaft bearings, blower, and edge trimmer assembly beyond repair. Break or bend main haft and upper shafts. mash the cat iron legs and junctions of the frame. Re- move belts. Burn all inflammable supplies. Bury tools spare parts, and noncombustible upplies.

PART THREE

MAINTENANCE INSTRUCTIONS

Section IX. SPECIAL ORGANIZATION TOOLS AND EQUIPMENT

100. Tools

Tools furnished \Yith the finishing machine are hown in figure 132.

10 I. Supplies

The using organization is is ued a 6 months' supply of the following spare parts and supplies:

Description	Quantity
F. S. heel sander (wood and felt)	2
Bottom sander (wood and felt), 9 inch	2
Belting and hooks (complete set)	1
Edge trimmer retaining screws	2
Grease, lubricating, cup, medium	
grade pounds	12
Oil, lubricating, No. 300A gallons	10
Brushes, inking, four-row	10
Wheels, abrasive	40
Stones, sharpening	15
Cloth and paper, combination,	
abrasivesheets	200
Cloth and paper, combination,	
heel breaster pieces	360
Ink, burnishing, browngallons	7
V.lax, shoemaker's, finishing, brown cakes .	150
Covers, roll, shoe finishing	200
Cutters, edge-trimming machine,	24
hields, cutter	12

Section X. LUBRICATION

I 02. Lubrication Chart

- a. The lubrication charts presented in figures 145 and 146 prescribe first and second echelon lubrication maintenance.
 - b. The service intervals specified in the lubrica-

tion charts are for normal operating conditions. Under extreme conditions, such as excessively high or low temperatures, prolonged periods of high peed, continued operation in sand or dust, immersion in water, or exposure to moisture, the intervals should be reduced. Failure to reduce them may re ult in malfunctioninO" 01: damage to the machine.

c. The lubricants prescribed in the KEY for use on thi machine are to be u eel at all temperatures.

I 03. Detailed Lubrication Instructions

- a. L BRFCATION E QUIPME NT. Each finishing machine is supplied with lubrication equipment adequate to maintain it. Make certain the lubrication equipment is cleaned both before and after use. Operate the equipment carefully and in such a manner as to insure a proper distribution of the lubricant.
- b. POINTS OF APPLICATION. Oilholes and grease cups are readily located by reference to the lubri-cation chart, which is supplemented by individual photographs of the points of lubrication. (See figs. 147 to 152 inclusive.) Wine all points and surrounding

147 to 152, inclusive.) Wipe all points and sur-rounding surfaces clean before applying the lubri-cant.

- r. CLEA ING. Use dry cleaning solvent or Diesel fuel oil to clean or wash all parts. Use of gasoline for this purpose is prohibited. After washing, dry all parts thoroughly before applying lubricant.
- d. LUBRICATION NOTES ON INDIVIDUAL UNITS AND PARTS. (1) *Trimlner*. Every clay lubricate the two upper and the two lowei shaft bearings with oil. Pour oil into the upper oil cup until it runs from the lower oilhole which opens out of the reservoir at the oil level.
- (2) Drive shaft. Every week lubricate the eight drive shaft bearings by adding oil to the top of the upper oilholes.
- (3) Clutch expandetr oilers. Every day lubricate the four clutch expander outer sleeve oilers and the four clutch expander inner sleeve oilers with

LUBRICATION CHART

MACHINE, FINISHING (LA NDIS- 102 / AMERICAN-"L")

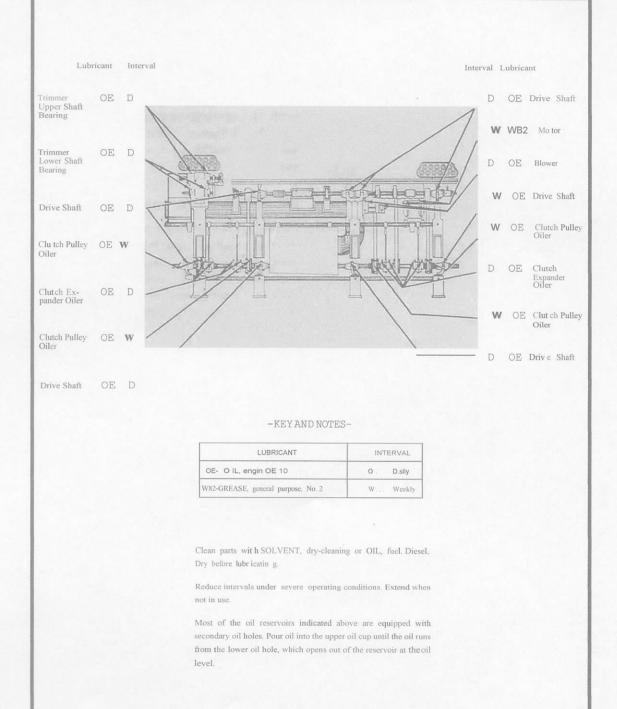


Fig1tre 145. Lubrication chart-Landis 102 and Americari L.

LUBRICATION CHART

PORTABLE SHOE REPAIR UNIT (LANDIS MODEL 12 K-100 SPECIAL)

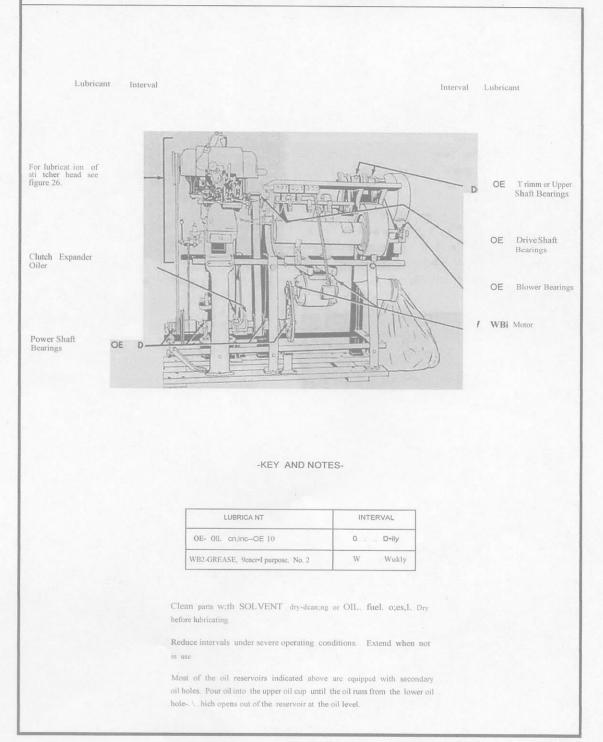
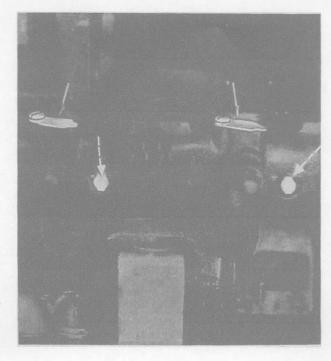
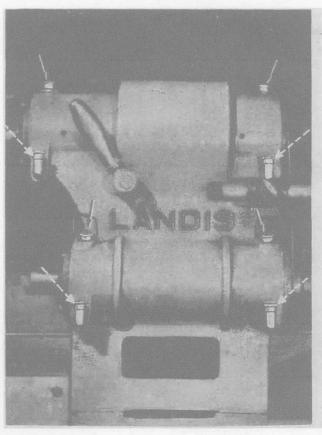


Figure 146. Litbrication chart-Landis 12 K-100 Special.

- oil. Every week the e re ervoir should be drained and filled to the top of the reservoir with new oil.
- (4) Clutch pulley O£/er. Every week add oil to the four clutch pulley oilers until the reservoir i filled and the wicks are saturated.
- (6) *Motor*. Every week add grea e to the two greas fitting on the motor.
- c. REPORTS AND RECORDS. (1) A record of lubrication may be maintained on vVD AGO Form 460.
- (2) Report unsatisfactory performance of eqmpment and lubricants on 'vVD AGO Form 468, to the Recla mation Branch, Field Service Divi ion, Office of The Quartermaster General, in accordance with pertinent W11ar Department circulars.



Fi.gll're 148. Drive shaft bearil 1gs.



Flg11re 147. Edge trimnzl!r bearings.



Figure 149. Clutch e.rpm1der.

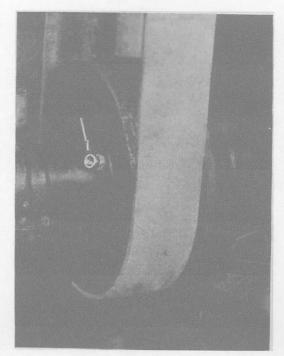


Figure 150. C/ntcl1 j>11/lc3>.

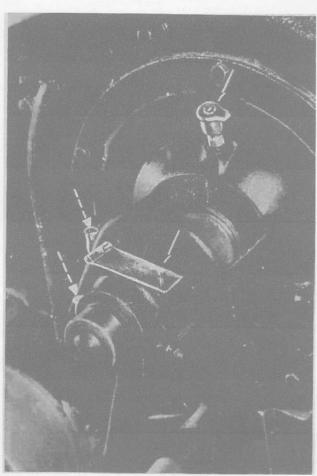


Figure 151. Blower.

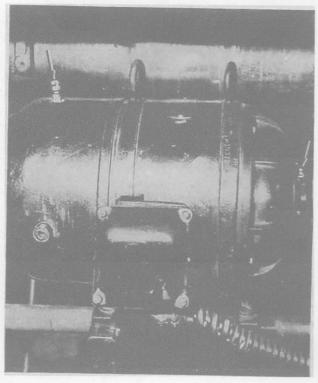


Figure 1-2. Motor.

Section XI. PREVENTIVE MAINTENANCE

I 04. General

Preventive maintenance services are performed by the maintenance per onnel of the usino- organization. The e services consist generally of before-, during-, and after-operation services p rformed by the oper- ator; and the scheduled weekly and monthly services performed by organizational maintenance per onnel.

I 05. Operator Maintenance (First Echelon)

- a BEFORE-OPERATION SERVICE. (1) General. This service is performed primarily to see that the machine ha not been damag clor tampered with ince the after-operation service (c below) was performed. In addition, it includes such services as are required to put the machine in proper condition for 9peration.
- (2) *Lubrication*. Lubricate the points of the machine as prescribed in figures 147 through 152.
- (3) Bearing alignment. Remove belts and turn shafts by hand. All shafts should turn freely. Bind-ing of any shaft should be reported to unit mechanic. If bearing alignment is satisfactory, replace belts.

- (4) Belt alignmel 1t. Start motor. Belts should ride evenly and center on crest of their pulleys. Belts should run between pulleys in a straight line.
- (5) Clutch action.. Engage each clutch with the clutch control lever. Clutch should engage smoothly and completely. Disengage clutch. Power transmission hould cease smoothly and quickly. If clutch drags or binds or does not engage completely, notify unit repairman and adjust a described in paragraph 111.
- (6) Hood clearance. Check hood oYer finishing wheels to ee that they are secure in their hinge. Make certain that clearance betwen finisher wheels and their hoods is adequate.
- (7) Changing wheel coverings. Examine the paper or abra ive cloth on the sanders and the cloth cover of the burnisher. Sandpaper should carry enough grit to be effectively abrasive. and paper should be sturdy enough to protect wood and felt of sanding wheels. The burnishilio- wheel cover should be in such condition that it will take the burnishing wax and will protect the burnishing wheel. When necessary, change wheel covers as described in paragraphs 91, 92, and 94.
- *h* DURING-OPERATION SERVICE. (1) *General*. An operator familiar with his machine quickly notices small changes in the, ound or feel of its operation. If such a change is noticed, the operator should stop the machine and locate the cau e by tm-ning the machine over slowly and closely observing the operation of its parts.
- (2) Clutch action. Clutches on finishing machine are relatively simple. Once correctly adjusted, they should cause little further trouble. They, should engage and disengage moothly and completely. If they do not, they should be adjusted by unit me-chanic according to instructions in paragraph 111. Clutches are commonly blamed for a slippage which actually occurs in the belting on the machine.
- (3) Belt tension. Belt tension may slacken so much that finishing shafts run below speed when shoes are pressed against finishing wheels. This condition is most likely to occur where humidity of air is high or when a new belt has been run in and has loosened. Belt tension and alignment should be adjusted by unit mechanic as described in para-graph 122.
 - C. AFTER-OPERATION SERVICE. (1) Gelleral.

- In the after-operation service the operator inspects hi machine for any deficiencies which may have developed during operation. He corrects those which he is permitted to handle and reports any other deficiencies to the unit mecl1anic or the authority re ponsible for maintenance of the finishing machine. The operator also performs those S6rvices on the machine which arise as a result of normal operation. Afteroperation service is designed to leave the machine ready for operation whenever it may be needed.
- (2) Cleaning d-itSt collector bag. (a) General. \text{Vhen the finishing machine is installed in van type trailers, the discharge pipe from the blower passes

through the floor of the trailer and discharges dust outside the trailer. Instructions included here apply to finishing machines operating in fixed installations.

- (b) Cleaning procedure. When blower fan is not running, shake dust collector bag and remove cleaning drawer. To shake the dust collector bag properly, slap sides of bag against sides of dust collector by pushing the haker handle in and allowing the bag to fall away from the collector screen. Then snap shaker handle forward and back with a slight pause at the end of each stroke. This procedure gives the bag a rocking motion, slapping it from front to rear against collector screen. Thorough beating of the bag cau es the dust to fall to bottom of dust collector. Start blower fan and run it a feYv seconds to blow dust into the clean-out drawer. Stop blower fan. Repeat this shaking and blowing operation two or three times at each cleaning. Under normal oper- ating loads, the bag should be shaken about twice a day. Empty clean-out drawer when full-about once a clay in normal operation.
 - (3) Bearing alignnient. ee a(3) above.
 - (4) Belt alignnient. See a(4) above.
 - (5) Clutch action. See a(S) above.
 - (6) Hood clearalLCe. ee a(6) above.
 - (7) Changing wheel coverillgs. See a(7) above.

I 06. Organization Maintenance (Second Echelon)

- a. GE ERAL. Regularly scheduled maintenance inspections and services are a preventive maintenance function of the using unit. They are the responsibility of commanders of the operating or-ganizations or installations.
 - b. FREQUENCY. The intervals between the pre-

ventive maintenance services listed here are considered a mmunum requirement for the normal operation of the machine. Under unusual operating conditions, such as extremely dirty surroundings, it may be necessary to perform certain maintenance services more frequently.

- c. FIRST ECHELON PARTICIPATION. The operator should be at his machine and assist the unit mechanic while second echelon preventive maintenance services are performed.
 - d. PROCEDURES. (1) W eekly. (a) Running tests.
 - 1. Belts. Belts should run over ere t of pulleys, without creeping from side to side. They should run in straight line from one pulley to the other and should be ti crht enough o that when work is pressed against finishing wheels, they do not slip and allow loss of motion in finishing shaft. (For adjustment of belts see par. 122.)
 - Clutches. Engage and disengage each clutch. It should encrage and disengage smoothly and completely. Power transmission should be continuous and even. (For adjustment of clutches see par. 111.)
 - (b) Hand operation tests.
 - 1. Bearings. Remove belts. Turn main shaft and finishing shafts by hand. Shaft should turn freely without bind- ing. Bearings should not be warm to the touch after machine has been oper- ated. Shafts should be free from end play. Check shaft set collars to see that they are tight and in correct posi- tion in relation to shaft bearings. If binding i found in bearings, adjust as described in paragraph 82c.
 - Finishing wheel hoods. Check hoods to see that they are secure in their hinges. Hood should clear finishing wheels in order not to damage the moving wheels.
 - Motor. See that housing and support of motor are clean. Check alignment of motor pulley and power shaft pulley. Unit mechanic should not attempt to repair mechanical failure within the motor.
 - (2) Monthly tests of nwts alld bolts. Check tight-

ness of all nuts and bolts on .machine. Normal vibration of the finishing machine in operation may loosen nuts and bolts enough to cause failure to operate or damage to the machine.

Section XII. TROUBLE SHOOTING

I 07. General

This section contains tro uble shooting in form ation which can be of help in determining and removing the causes of trouble that may develop in this ma- chine. The principal symptoms of trouble are loss of motion and excessive vibration. Paragraph 108 lists the causes for loss of motion and their reme- dies. Paragraph 109 lists the causes for excessive vibration and their remedies.

108. Causes and Remedies for Loss of Motion

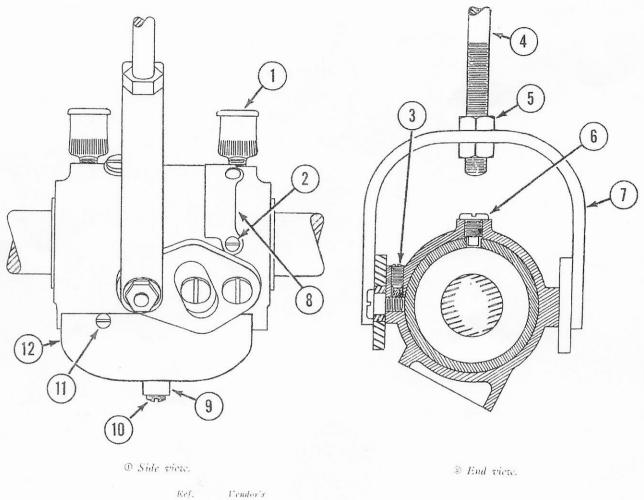
Possible cause	Remedy
Slipp ing clutch	Check engao-ement of clutches and adjust if necessary. (See par. 111.)
Slipping belts	Check tensions of belts. Start with power shaft drive belt. (See 21, fig. 129.) Then check remaining belts and tighten if nece sary. (See par. 122.)

I 09. Causes and Remedies for Excessive Vibration

Possible cause	Remedy		
Unbalanced condition clue to improper position of wheels on finishing shaft.	Engage clutch of each finishing sha[t separately. If haft vi- brates excessively, ad just fin- ishing wheels on it so work load on shaft is evenly dis- tributed.		
Binding of bearings on shaft.	Remove belts. Shafts should turn freely by hand. If shaft binds in bearing, align bear- ings on that shaft. (See par. 82.)		
Badly worn or poqrly patched belt.	Check condition of all belts. One at a time, remove belts which are in such poor condition that they might be causing excessive vibration. Operate machine with defective belt removed. If vibration is no longer present, replace old		
	belt.		

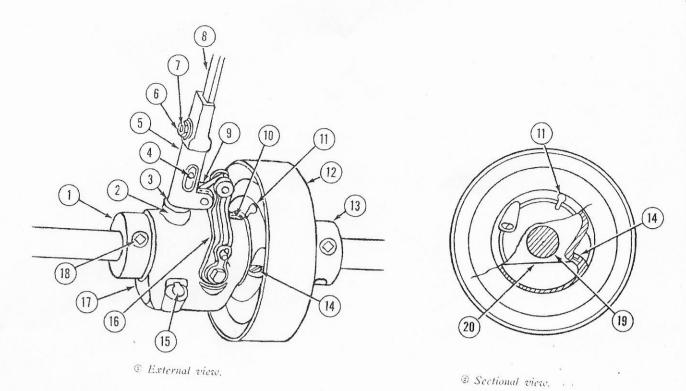
Section XIII. CLUTCH ASSEMBLY 110. Description

Clutches on Landis, 100 Line, Model 102 and American Model L finishing machines are similar in operation but slightly different in construction. The Landis finisher has a friction disk clutch (fig. 153) and the American finisher has a friction cone clutch (fig. 154).



part No. Vendor's nomenclature 7-913N Clutch expander inner sleeve oiler. Clutch body dust guard setscrew. 7-313NA 3 7-313L Clutch expander cam roll stud setscrew. 7-13U Clutch expander rod. 5 7-313U Clutch expander rod adjusting nut. 6 7-313LA Clutch expander sleeve screw. 7 7-13R Clutch expander fork. 8 Clutch body dust guard. 7-613NA 9 7-113L Clutch drain plug bushing. 10 7-9131. Clutch oil drip pan plug. 11 7-3131.B Clutch oil drip pan setscrew. 12 7-613L Clutch oil drip pan.

Figure 153. Clutch (Landis 100 Line model 102).



Ref. Vendor's No. part No. Vendor's nomenclature CP-19 Clutch set collar (with screw). Clutch housing boss. 3 Positioning point "x" for spacer. CP-13C Stop pin. 5 CP-13 Rod end. 6 CP-13H Jam nut. CP-13G Clutch rod connecting screw. 8 Clutch rod. 9 CP-I3D Link. 10 Witness mark on housing. 11 Witness mark on pulley. 12 CP Clutch pulley. 1.3 CP-15 Cone driver. 14 Pipe plug for oiling pulley. 15 Oil cup. 16 CP-11 Clutch yoke. 17 Clutch housing. 18 Clutch set collar setscrew. 19 Power shaft. 20 Oil level.

Figure 154. Clutch assembly (American).

III. Adjustment (fig. 154)

There are four basic adjustments on the clutch which must be made correctly and in proper sequence to secure efficient clutch operation.

- a. Cone driver. Set cone driver (13, fig. 154) so that clutch pulley (12) lines up with top shaft pulley.
- b. Set collar. Set the set collar (1) so that clutch will have proper release when disengaged. There are two ways of setting set collar.
- (1) Disengage clutch and release set collar setscrew (18). Push clutch pulley (12) and set collar (1) against cone driver (13). Back set collar away from cone driver about 1/16 inch and lock set collar. The setscrew in the set collar should lock on the flat milled in the power shaft.
- (2) Set a 7/32-inch spacer (a square or round rod) on top of housing boss (2). Engage clutch. Spacer will then be clamped between rod end (5) and housing boss (2). Push pulley and set collar against cone driver. Lock set collar setscrew on milled flat in power shaft. Use of the 7/32-inch spacer establishes a definite release of clutch pulley when clutch is disengaged. Release should be a full 1/16 inch.
- c. CLUTCH AND CONE DRIVER. The pipe clamp bracket should be set so that the bottom of cored slot in rod end (5) touches stop pin (4) in housing post, allowing clutch to swing away from cone driver when clutch is disengaged. To make this adjustment, disengage clutch when power shaft is running. Release pipe clamp (3, fig. 155) and pull clutch rod (8, fig. 154) up so that rod end (5) is against stop pin (4). Set pipe clamp on top pipe so that pulley swings away from cone driver (13). Turn pipe clamp on pipe until the stop (5, fig. 155) on hand lever touches abutment on pipe clamp. Lock pipe clamp. The purpose of the above adjustment is to bring the rod end into proper position and then to set stops on pipe clamp and hand lever to a position in accordance with that of the rod. When the power shaft is running and the clutch is disengaged, the clutch pulley should ride against the set collar.

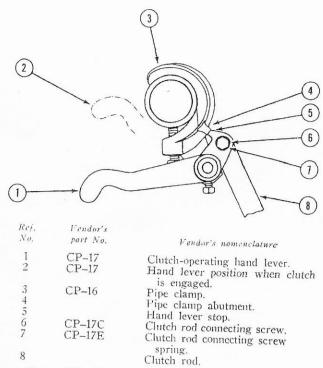
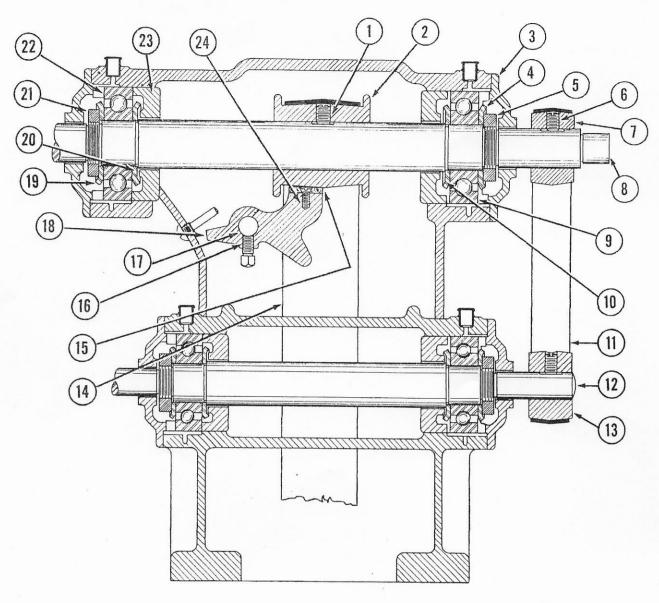


Figure 155. Clutch-operating hand lever (American).

d. Clutch Housing. The clutch housing floats on pulley when clutch is engaged. To permit free action of the housing, the connections of clutch rod (8, fig. 154) to the rod end (5) and clutch handle are not clamped tight. The screw (7) at rod end should be brought up to clamp the rod and then backed off one-half turn and locked with jam nut (6). The screw (6, fig. 155) in the clutch handle, connecting the clutch rod and handle, is tightened to compress the spring (7) about one-third its length. Lock it at that position with the jam nut. The spring checks vibration and tends to hold pulley away from cone driver when pipe clamp is properly set.

Section XIV. EDGE TRIMMER ASSEMBLY

The edge trimmer assembly is seldom disassembled. The unit mechanic is usually concerned only with the edge trimmer cutter (par. 89) and the cutter grinder. (See pars. 115, 116, and 117.) However, it may be necesary to replace bearings on upper trimmer shaft. (See 8, fig. 156.) The partial disassembly and assembly required to perform that service are included in this section. Since the heel trimmer of the edge trimmer assembly is not used by the Army, it is not included in instructions in this section.



Ref.	Vendor's		Ref.	Vendor's	
No.	part No.	Vendor's nomenclature	No.	part No.	Nomenciature
1	2-305E	Edge trimmer upper pulley set-	12	2-401SA	Heel trimmer shaft.
		screw.	13	2-6	Heel trimmer driven pulley.
2	2-5	Edge trimmer upper pulley.	14	2-19	Trimmer driving belt.
3	2-1B1	Upper shaft bearing cap.	15	2-918	Brake friction stripe.
4	2-601B	Outer upper shaft right-hand bear-	16	2-318SA	Trimmer brake setscrew.
		ing oil flinger.	17	2-418SA	Brake shaft.
5	2-1C	Upper shaft right-hand bearing re-	18	2-18	Edge trimmer brake.
		taining collar.	19	2-601B	Outer upper shaft left-hand bear-
6	2-305F	Heel trimmer drive pulley set-			ing oil flinger.
2,557		screw.	20	2-601B	Inner upper shaft left-hand bear-
7	2-5A	Heel trimmer drive pulley.			ing oil flinger.
8	2-401S	Upper trimmer shaft for grinding	21	2-1C1	Upper shaft left-hand bearing re-
		wheel.			taining collar.
9	2-901E	Upper shaft ball bearing.	22	2-901E	Upper shaft ball bearing.
10	2-601B	Inner upper shaft right-hand bear-	23	2-1C2	Upper shaft bearing retaining plug.
		ing oil flinger.	24	2-318SC	Trimmer brake strip screw.
11	2-20	Heel cutter belt			The state of the s

Figure 156. Edge trimmer assembly.

113. Dissembly (fig. 156)

- a. Remove belt from edge trimmer upper pulley. (See 2, fig. 156.)
- b. Remove cutter-grinder retaining screw and then remove cutter grinder from right-hand end of upper trimmer shaft (8).
- c. Remove edge trimmer cutter grinder (par. 89) from left-hand end of upper trimmer shaft.
- d. Remove belt guard retaining screws and remove belt guard and cutter-grinder shield attached.
- c. Since heel trimmer is not normally used by the Army, heel trimmer drive pulley (7) normally will not be in place on upper shaft as shown. If it is in place, loosen setserew (6) and remove pulley from right-hand end of upper shaft.
- f. Remove retaining screws in right-hand upper shaft bearing cap (3) and remove bearing cap.
- g. Remove retaining screws in left-hand upper shaft bearing cap and remove bearing cap.
 - h. Release edge trimmer brake (18).
- i. Turn edge trimmer shaft (8) by hand until setscrew in edge trimmer upper pulley (2) can be reached with screw driver. Loosen setscrew until it clears shoulders of flat milled in shaft.
- j. Remove upper shaft left-hand bearing retaining collar (21) by turning it on shaft until it is free of the threads holding it on the shaft.
- k. From right-hand side of edge trimmer assembly pull edge trimmer shaft out of assembly until left-hand end of shaft is free of left-hand shaft bearing.
- I. Remove outer upper shaft left-hand bearing oil flinger (19).
- m. Remove left-hand upper shaft ball bearing (22).
- n. Remove inner left-hand upper shaft bearing oil flinger (20).
- o. Continue to pull upper shaft to the right until left-hand end of upper shaft is about to pass through right-hand upper shaft bearing.
- p. Insert hand through hole in edge trimmer hood and remove edge trimmer upper pulley (2) from end of shaft.

- q. Continue to pull upper shaft to right until it passes through right-hand upper shaft bearing and is clear of edge trimmer assembly. (Upper shaft right-hand bearing retaining collar (5) is left on shaft to act as key to proper position of shaft in assembly of the edge trimmer unit.)
- r. Remove outer right-hand upper shaft bearing oil flinger (4).
- s. Remove right-hand upper shaft ball bearing (9).
- t. Remove inner right-hand upper shaft bearing oil flinger (10).

114. Assembly (fig. 156)

- a. Place outer right-hand upper shaft bearing oil flinger (4) on left-hand end of upper shaft.
- b. Place right-hand upper shaft ball bearing (9) on left-hand end of upper shaft.
- c. Place inner right-hand upper shaft bearing oil flinger (10) on left-hand end of upper shaft.
- d. Push the three parts (a, b, and c above) along shaft until they are snug against upper shaft right-hand bearing retaining collar (5).
- c. From the right, insert left-hand end of upper shaft through right-hand upper shaft bearing retaining plug (23).
- f. Pass edge trimmer upper pulley (2) through hole in edge trimmer hood, and place pulley on end of upper shaft as it emerges from upper shaft bearing retaining plug.
- y. Pass upper shaft on through edge trimmer assembly until left-hand end of shaft passes through left-hand upper shaft bearing retaining plug (23).
- h. Place inner left-hand upper shaft bearing oil flinger (20) on left-hand end of upper shaft.
- i. Place left-hand upper shaft ball bearing (22) on left-hand end of upper shaft.
- j. Place outer left-hand upper shaft bearing oil flinger (19) on left-hand of upper shaft.
- · k. Place upper shaft left-hand bearing retaining collar (21) on left-hand end of upper shaft.
- 1. From the right, pass upper shaft on through edge trimmer assembly until upper shaft right-hand bearing retaining collar (5) holds upper shaft right-

hand bearing and oil flinger assembly in position against upper shaft right-hand bearing retaining plug (23).

- m. Move edge trimmer upper pulley (2) on upper shaft until edge trimmer upper pulley setscrew (1) is in position over flat milled on shaft. Tighten setscrew.
- u. Move upper shaft left-hand bearing and oil flinger assembly to the right on upper shaft until assembly contacts upper shaft left-hand bearing retaining plug (23).
- o. Move upper shaft left-hand bearing retaining collar (21) right on upper shaft until collar strikes threads on upper shaft.
- p. Turn retaining collar on threads until collar holds upper shaft left-hand bearing and oil flinger assembly in position against upper shaft left-hand bearing retaining plug.
- q. Slide upper shaft left-hand bearing over left-hand end of upper shaft. Place bearing cap in position on bearing housing. Insert bearing cap retaining screws and tighten them securely.
- r. Install edge trimmer cutter unit (par. 89) on left-hand end of upper shaft.
- s. Slide upper shaft right-hand bearing cap (3) over right-hand end of upper shaft. Position bearing cap on bearing housing. Insert retaining screws and tighten them securely.
- t. Place belt guard and cutter-grinder shield, attached in position, on right-hand side of edge trimmer housing. Insert retaining screws and tighten securely.
- u. Install cutter-grinder (par. 89) on right-hand end of upper shaft.
 - τ. Replace belt on edge trimmer upper pulley (2).

Section XV. CUTTER-GRINDING ASSEMBLY

115. Description

The cutter-grinding wheel operates on the end of the edge trimmer assembly upper shaft. Operation of the cutter-grinder is controlled by the edge trimmer clutch. The grinder has a universal attachment which permits setting the cutter to required position for grinding, and an indexing adjustment which controls the uniform grinding of the cutter teeth.

116. Adjustment (fig. 157)

Tighten screw (8, fig. 157) so that cutter-grinder post (7) will not swivel on shaft (9). Release thumbscrew (11) and position cutter-grinder as shown in figure 157. Pull post (7) forward so that cutter clears outside edge of wheel about ½ inch. Lock grinder post shaft (9) with thumbscrew (11). Adjust screw (8) so that cutter is positioned as in figure 157. as previously set, but do not permit grinding wheel to snag bottom of cutter-grinder tooth. Set grinder table (5) so that grinding wheel covers full face of tooth to be ground and lock table in position with knurled screw (16).

117. Grinder Operation (fig. 157)

- a. General. Cutter teeth must be sharp and uniformly ground if they are to trim shoes properly and quickly. Do not attempt to grind teeth down too quickly because it overheats them, and overheating lessens the temper of the cutter teeth.
- b. Procedure. The cutter rests on grinder table (5) and is positioned by the locating pin (15). Turn table adjusting screw (6) so that the face of the cutter tooth just touches the side of the grinding wheel. Allow sufficient clearance between cutter tooth space and locating pin (15) to permit a small turning movement of the cutter toward the grinding wheel. This movement of the cutter is necessary so that it can be moved to the grinding wheel and then held against face of wheel as cutter post is moved in and out. This permits taking light cuts and preserves the shape of the grinding wheel. When the cutter is very dull, do not attempt to sharpen it in one setting, but make a complete circuit of the cutter several times. It is unnecessary to change the position of the grinder post fulcrum shaft (9) because the adjusting screw (8) can be used to set the grinder table (5) to suit the cutter and to position the teeth for grinding so their original face angle is retained.

Section XVI. FINISHER BRUSH ASSEMBLY

118. Description

The finisher brush is treated as an assembly (fig.

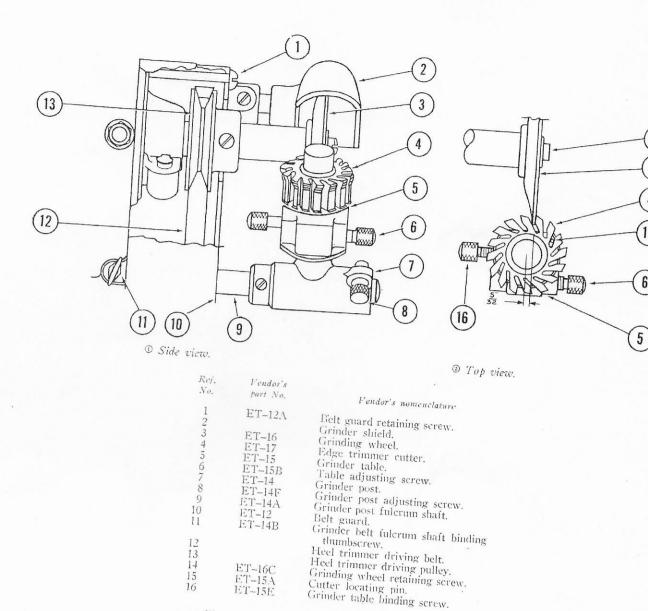


Figure 157. Cutter-grinder assembly (American).

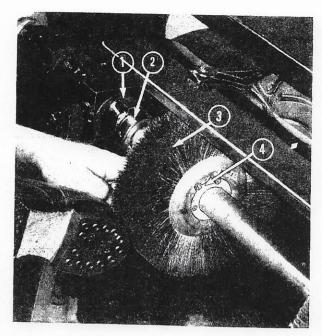
158) because the brushing surface and the wheel comprise a single unit. Thus the entire unit must be replaced when the brush is so worn or damaged that it will not perform efficiently.

119. Removal (fig. 158)

Loosen setscrew (4, fig. 158) on each side of the brush wheel until the wheel turns freely on shaft. Loosen the setscrew in the set collar (2) at each end of brush and burnisher shaft. Slide end of shaft closest to the brush out of the shaft bearing (1). Remove the set collar (2) from the end of the shaft. Remove the brush wheel from the end of the shaft.

120. Installation

Place the new brush wheel on the shaft. Replace the set collar (2, fig. 158) on the shaft. Insert the end of the shaft into the bearing. Position the shaft so that the belt between the brush and burnisher shaft and main shaft is aligned with its pulleys. Slide the set collars out to the shaft bearings and tighten the setscrews to hold the brush and burnisher shaft in correct position. Space the brush wheel on the shaft so that it divides the space between the adjacent fixtures on the shaft, and tighten the setscrews (4) in the brush wheel.



Ref. $No.$	Vendor's part No.	l'endor's nomenclature
1	FB-1	Shaft bearing.
2 3 4	FW-64	Shaft set collar. Finishing brush wheel. Finishing brush wheel setscrew.

Figure 158. Finishing brush assembly,

Section XVII. BELTS

121. Description

Good belts are essential to the efficient operation of the finishing machine. The ability of the belts to transmit power from power shaft to finishing shafts is directly related to the performance of the finishing wheels on the machine. Leather belts are standard for the finishing machine, but rubber belts may be used when humidity is so high that leather belts would stretch excessively.

122. Adjustment

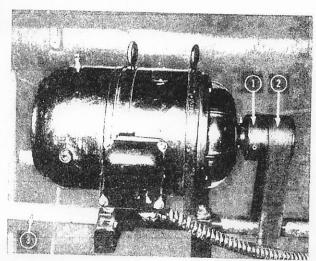
When measuring a leather belt for fitting, be sure to allow for the normal stretch which will occur in the belt after the belt has been run in. In leather belts the stretch usually amounts to ½ inch for each foot of belt length. For example, if the actual measured distance around the pulleys to be connected is 6° feet, cut the belt 6/8 inch less than 6 feet, or 5 feet 11 2/8 inches long. Ends of belt should be cut square and, when ends are fastened together, the sides of joined ends must be in line. An improperly fastened belt will creep from one

side of the pulley to the other, and the excessive wear will ruin the belt in a short time. No. 1 stag belt hooks are satisfactory fasteners for leather belts. Points of hooks should go to the pulley side of belt. Whenever leather belts stretch so much that they slip on pulleys, they must be shortened. Be sure that all belts are checked for sufficient tension before loss of motion in the finishing shafts is blamed on clutches (pars. 110 and 111) or motor.

Section XVIII. MOTOR

123. Description

A 1½-horsepower, single-phase, 60-cycle, 110- to 220-volt, 1.750-revolutions-per-minute motor is used on the finishing machine.



Ref. No.	Vendor's part No.	Vendor's nomenclature
1 2 3	555 FC-413	Motor pulley. Motor belt. Motor rail.

Figure 159. Motor.

124. Installation

Install the motor on the frame provided on the finisher. (See fig. 129.) Make sure that motor pulley is running in the direction which will turn the top of the finishing wheels forward. The motor should be connected to a 220-volt circuit, if possible. If the motor is changed from a 110-volt to a 220-volt circuit, or changed from a 220-volt to a 110-volt circuit, be sure to change wiring connections as shown in the diagram on the inside back cover of the switch box. (See fig. 129.)

125. Maintenance

- a. Keep motor housing and external parts of motor clean.
- b. Lubricate motor according to instructions listed in paragraph 103.
- c. For maintenance authorized third and higher echelons, see TM 9-1825A.

PART FOUR AUXILIARY EQUIPMENT

(The attachments, parts, and subassemblies on the finishing machine, as it is used by the Army, are

integral parts of the machine and are not classified as auxiliary equipment.)

PART FIVE REPAIR INSTRUCTIONS

(Because of the simplicity of the design and construction of the finishing machine, repairs made on it are performed with the tools and by mechanics

authorized to the using organization. Therefore, part five does not apply to this machine.)

BOOK 3 SOLE CUTTER AND SKIVER MACHINES

American Model C

Landis Model

Section I. GENERAL

126. Scope

The instructions in book 3 apply to the sole cutter and skiver machines, American Model C and the Landis Model. These machines are used to cut and shape the leather soles of shoes.

- a. Part two contains operational information for the guidance of personnel responsible for the operation of sole cutter and sldver machines.
- b. Part three contains information for the guid- ance of personnel of using organizations responsible for the first and econd echelon maintenance of sole cutter and skiver machines. It contains information needed for the scheduled lubrication and preventive maintenance services.

127. Records

a. 'WD AGO FoRi\I 460 (PREVENTIVE MAINTE-NANCE RoSTER). The parts of this form which apply to cutter and skiver machines may be main-tained to record the lubrication of this equipment, as de cribed in paragraphs 146 and 147.

b. WD AGO FORM 468 (UNSATISFACTORY EQUIPMENT REPORT). This form will be used to report defects in the manufacturing, de ign, or operation of machines, assemblies, or parts. It will also be used to report complaints on the lubricants and preserving materials used in the machine. When so

used, the form will contain identifying details of the products and the machinery on which they are used.

128. Orientation

Throughout this book, the terms FRONT, REAR, LEFT, and RIGHT will be used as the operator facing the front of the machine in the operating position would use them.

Section II. DESCRIPTION AND DATA

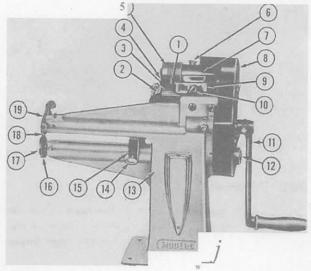
129. General

These machines are table-motmted and hand-

operated. They are simple in de ign and operation.

130. Identification

The name and the model number of the American machine appear on the front of the stand column of the machine. (See fig. 160.) The name of the Landis sole trimmer (fig. 162) and the name and serial number of the Landis sole skiver and beveler (fig. 161) appear on the front of the stand column of each machine.



		W
Ref. No.	N-4	
110.	Notnenclat11re	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Skiver knife. Skiver bottom shaft retaining shoe. Skiver knife table. Skiver knife table. Skiver top roll. Skiver head oil cup. Skiver head. Gear guard. Skiver work gauge. Skiver work gauge washer screw. Hand crank. Sole trimmer feed wheel shaft. Sole trimmer work gauge thumbscrew. Sole trimmer work gauge. Sole trimmer work gauge. Sole trimmer work support roll. Sole trimmer blade.
10	Sole trimmer blade guard.

Figure 160. American model C sJ/e cutter alld skiver.

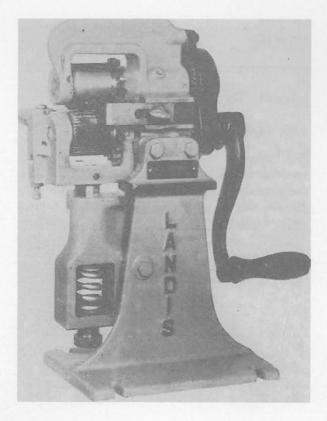


Fig11re 161. Landis sole skiver a,n d beveler.

13 l. Differences in Models

- a. LANDIS SOLE SKIVER AND BEVELER. This machine (fig. 161) is designed to skive (shave down) the hank o{ the sole and cut a beveled edge around the bottom of the sole.
- b. LANDIS SOLE T Ri NIMER. This machine (fig. 162) is used to cut soles from leather strips and to trim applied soles before they are stitched.
- c. AMERICAN SOLE CUTTER AND SKIVER. This cutter and skiver (fig. 160) performs the combined functions of the machines described in a and b above. It cuts, bevels and skives the sole, and trims it on the shoe before stitching. Each operation upon the sole is performed similarly, regardless of the machine used. The difference in the models is in the number or kind of operations performed by each machine.

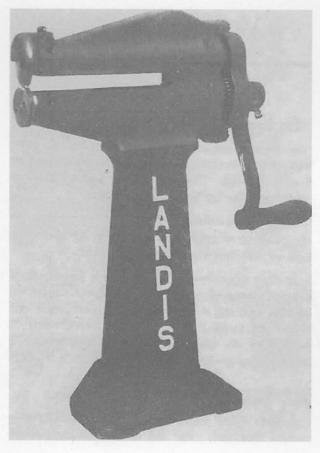


Fig-Iwe 162. Landis s.Jle trimme r.

Section III. TOOLS AND ACCESSORIES

132. Tools

These small machines are simple in construction and operate only in conjunction with more complicated shoe repair machinery equipped with tools. Only one tool is issued with the cutt ing and skiving machines-a single-headed wrench which is used to remove the cutt ing blades (16 and 18, fig. 160) from the driving shafts. The other machines in the shoe repair unit carry sufficient tools to disassemble the cutter and skiver machines completely.

133. Equipment

I o equipment or supplies are issued with these machines.

PART TWO

OPERATING INSTRUCTIONS

Section IV. SERVICE UPON RECEIPT OF EQUIPMENT

134. New Equipment (fig. 160)

a. INSPECTION FOR DAMAGE IN SHIPMENT. Check to see that the slciving blade (1, fig. 160) is unbroken and is set in place on its table (4). Check condition of cutting knives. The operating crank will be shipped detached from the machine. Be sure it is included in the shipping package. Check tightness of the retaining screws and nuts.

b. REMOVAL OF CORROSION-PREVENTIVE MATE-RIAL. The working parts of the machine may be covered with grease, heavy oil, or some other corrosion-preventive material when the machine arrives. Remove this material with a brush or cloth soaked in cleaning solvent or Diesel fuel oil. Lubri- cate the machine according to instructions in para-graphs 146 and 147.

- c. INSTALLATION. (1) Assembly. Place the hand crank (11, fig. 160) on the end of the driving shaft on the right side of the machine and turn the crank until the crank-retaining setscrew is aligned with the flat milled on the driving shaft. Tighten the set- screw securely.
- (2) Location. In the van type shoe repair trailer, align holes in the base of the stand of the machine with matching holes in the bench on the trailer. Secure the machine with the .nuts and bolts pro-vided for installation. In the two-wheel shoe repair trailer, installation consists of removing machines from carrying clamps and placing machines in

clamps on the bed of the trailer. In fixed shoe repair installations, machines will be placed on a bench high enough for them to be in a comfortable oper-ating position. Bore holes in the surface of the bench to correspond with the holes in the base of the stand of the machine and secure with nuts and bolts. If the bench surface is wood, the machine may be secured with lag screws.

d. RuN-IN TEST. Feed a piece of leather into the cutting knives without forcing it. The cut made

by the knives should be clean and complete. Feed a piece of leather into the skiving blade. Adjust the position of the skiving blade (par. 139) until the skive is clean and the angle of the skive is satisfactory.

135. Used Equipment

Service upon receipt of used equipment is similar to service of new equipment described in para-graph 134.

Section V. CONTROLS AND INSTRUMENTS

136. Skiving-Blade Adjustment Screws

- a. HORIZONTAL ADJUSTING SCREWS. The horizontal adjusting screw is located at the rear of the skiving blade. Turning the screw in forces the skiving blade forward on its table toward the feed rolls, while turning it out moves the blade to the rear away from the rolls.
- b. VERTICAL ADJUSTING SCREWS. The vertical adjusting screw is located beneath the skiving blade. Turning the screw in and up increases the length of the sleive of the sole, while turning it out and clown decreases the length of the skive of the sole.

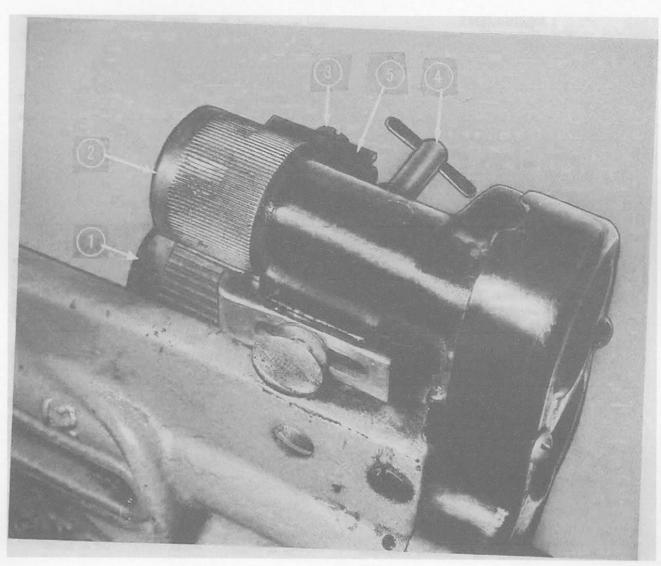
137. Skiver Work Gauge (fig. 160)

The skiver work gauge (9, fig. 160), located on the face of the skiver head (7), guide the sole through the rolls of the skiver. The work gauge is secured to the skiver head with a thumbscrew (10). The work gauge may be moved right or left to deter-

mine the width of the skive or the level of the sole. Moving the work gauge to the left makes the skive narrower while moving it to the right makes it wider.

138. Sole Cutter Work Gauge (fig. 160)

The sole cutter work gauge (15, fig. 160), located between the upper and lower cutter arms of the sole cutter frame (13), is secured to the lower trimmer arm by a thumbscrew (14). The work



No, nenclature

Bottom skiver roll.
Top skiver roll.
Horizontal adjusting screw.
T-hanclle bincling screw.
Skiver blade.

Fig.ure 163. Skiver adj11st111ent.

gauge determines the width of the piece to be cut from leather by the cutter blades. Moving the cutter work gauge to the right increases the width of the cut which can be made, while moving it to the left decreases the width of the cut.

Section VI. OPERATION UNDER USUAL CONDITIONS

139. Skiving

- a. SETTIN'G FEED ROLLS. The top and bottom feed rolls (5 and 3, fig. 160) hould be set 3/32 inch apart. They are adjusted to that position by moving the adjusting cap screw going through the fork at the rear of the machine.
- b. SETTING SKIVING KNIFE. Ad ju st the horizontal ad ju sting screw (3, fig. 163) at the rear of the skiving knife to bring the cutting edge of the knife about 1/64 inch short of the forward stop. The inside cutting edge of the knife should clear the skiver top roll (2) about 1/32 inch. The out-side cutting edge of the knife should clear the kiver bottom roll (1) a cant 1/32 inch. This adjustment ets the skiving knife at a slight angle to the rolls. To adjust the angle position of the inside edge of the sk iving knife, loosen the **T-** handle binding screw (4) and turn the eccentric bushing to the proper position. Tighten the cap screw. When the skiving knife (5) has been positioned, tighten the knife-retaining screws.
- c. OPERATION. Turn the hand crank (11, fig. 160) evenly. Feed leather against the skiver work gauge (9, fig. 160) and between the feeding rolls. Do not force leather against the knife. If the feed rolls and the knife are set properly, the leather will be drawn into the knife smoothly and without jam-ming. Adjust the position of the sk iving lmife (b above) until the angle and the length of the skive are satisfactory.

140. Cutting and Trimming

- a. AnJUSTI 'G SOLE CUTTER WORK GAUGE. Loosen work gauge thumbscrew. (See 14, fig. 160.) Slide the work gauge (15, fig. 160) on the lower arm until the distance between the work gauge and the sole cutter blade (18, fig. 160) equals the width of the cut which is to be made in the leather. ecure the work gauge thumbscrew.
 - b. CUTTING. Turn hand crank, place the edge of

the leather flat against the work gauge, and start the encl of the leather between the cutter blade and the cutter feed wheel. (See 16, fig. 160.)

c. TRIMMING. Turn hand crank and guide the ole of the shoe upon the sole cutter work support roll. (See 17, fig. 160.) Trim the sole to the margin desired.

Section VII. OPERATION UNDER UNUSUAL CONDITIONS

141. General

The simple design and the slow operating speed of cutter and skiver machines make them relatively unaffe cted by most unusual operating conditions which could be tolerated by the operator. However, some precautions should be taken to protect machines from dust and dirt when necessary.

142. Operation in Extremely Dusty or Dirty Conditions

Operating a dirty machine damages it. Remove sand and grit before placing shoes or leather in the cutter and skiver machines. Clean feed rolls, trim-ming wheel, and exposed gear surf aces daily when operating under extremely duty or dirty conditions.

Section VIII. DEMOLITION TO PREVENT ENEMY USE

143. General

In a theater of war, where Ii nes are fluid and the tactical ituation may change rapidly, it may be nec- e sary to di pose of this equipment quickly so that the enemy may not use it.

144. Procedures

- a. REMOVAL. If possible, move the machines in the shoe trailer to some safe location outside the threatened area.
- b. Di POSAL. If removal is not possible, demolish the machines so thoroughly that nothing in them is useful to the enemy. Use the ax or mattock in the trailer to smash the frame, feed rolls, trimming wheels, driving shafts, driving gears, and the crank of the machine.

PART THREE

MAINTENANCE INSTRUCTIONS

Section IX. SPECIAL ORGANIZATION TOOLS AND EQUIPMENT

145. General

No special organization tools and equipment for sole cutter and skiver machines are issued. Because of their simple design, they may be serviced adequately with tools issued with the other repair machinery used in conjunction with them.

Section X. LUBRICATION

146. Lubrication Chart

- a. The lubrication chart presented in figure 164 prescribes first and second echelon lubrication maintenance.
- b. The service intervals specified in the lubrication chart are for normal operating conditions. Under extreme conditions, such as excessively high or low temperatures, continued operation in sand or dust, immersion in water, or exposure to moisture, these intervals should be reduced. Failure to reduce them may result in malfunctioning or damage to the machines.
- c. The lubricants prescribed in the KEY for use on this machine are to be used at all temperatures.

147. Detailed Lubrication Instructions

a. LUBRICATION EQUIPMENT. Each sole cutter and skiver machine is supplied with lubrication equipment adequate to maintain it. Make certain that the lubrication equipment is cleaned both before

and after use. Operate the equipment carefully and

in such manner as to insure a proper distribution of the lubricant.

b. POINTS OF APPLICATION. Oilholes are readily located by reference to the lubrication chart, which is supplemented by individual photographs of the points of lubrication. (See figs. 165 through 168.) Wipe all points and surrounding surfaces clean before applying the lubricant.

- c. CLEANI G. Use dry-cleaning solvent or Diesel fuel oil to clean or wash all parts. The use of gaso-line for this purpose is prohibited. After washing, dry all parts thoroughly before applying lubricant.
- d. LUBRICATION J. OTES ON INDIVIDUAL UNITS AND PARTS. Every week lubricate the following moving parts with one or two drops of engine oil:
 - (1) Feed roll shaft.
 - (2) Feed knife shaft.
 - (3) Cutter shaft.
 - (4) Gears.

Section XI. Preventive Maintenance

148. General

Preventive maintenance services are performed by the maintenance personnel of the using organization. These services generally consist of before-, during-, and after-operation services performed by the operator; and the scheduled services (weekly and monthly) performed by organizational maintenance personnel.

149. Operator Maintenance (First Echelon)

- a. BEFORE-OPERATION SERVICE. (1) General. This inspection schedule, is designed primarily as a check to see that the cutter and skiver machines have not been damaged or tampered with since last after-operation service was performed.
- (2) *Procedures.* (a) Lubrication. Lubricate according to instructions described in paragraphs 146 and 147.
 - (b) Skive<r. Turn hand crank and observe the

motion of feed rolls. They should turn easily. See that they are spaced 3/32 inch apart, as they were set. Check position of the skiver knife to see that it is set properly for the type of work to be done.

(c) Cutter. Turn hand crank and check action of the cutter blade and the cutter feed wheel. They should be firmly attached to the driving sh afts, and the shafts should turn freely.

LUBRICATION CHART MACHINE, COMBINATION SOLE CUTTER AND SKIVER (AMERICAN "("-LANDIS) Feed Roll Shaft Feed Knife Shaft 1 Feed Knife Shaft Cutter Shaft Cutter Shaft -KEY AND NOTE-LUBRICANT LOWEST EXPECTED TEMPERATURE Above 32° F. Below 32° F. OE-OIL, togine OE10 OE10

Every week lubricate those moving parts indicated above with two or three drops of OE.

Figure 164. Lubrication chart.

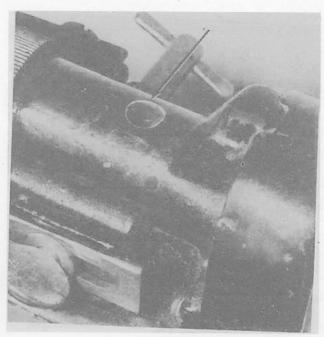


Figure 165. Feed roll shaft bearillg-to;,.



Figure 166. Feed rail and rntter shaft bearings-feft side.

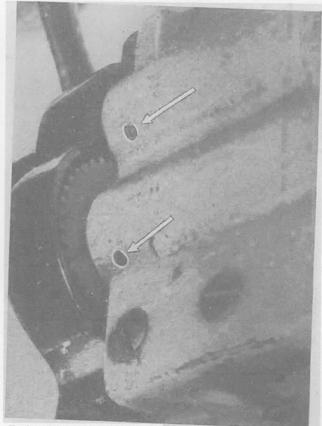
b. DURING-OPERATION ERVICE. The only service which must be performed during operation is the adjustment of th skiving blade in case it hould be moved out of position or must be adjusted to change the . kive of the leather.

c. AFTER-0PERATIO SERVICE. Check position of skiver feed rolls. See that the cutter blade is properly aligned with the cutter feed wheel. Check position of skiving blade. Check the cutting edge of skiving blade. If it is dull, report its condition to the tmit mechanic so that it may be sharpened according to in tructions listed in paragraph 156. If necessary, clean the machine with a cloth or brush soaked with Diesel foe! oil or drycleaning solvent.

150. Organization Maintenance (Second Echelon)

a. GE ER1\L. Regularly scheduled maintenance in pections and ervices are a preventive maintenance function of the u ing unit. They are the reponsibility of commanders of the operating organizations or installations.

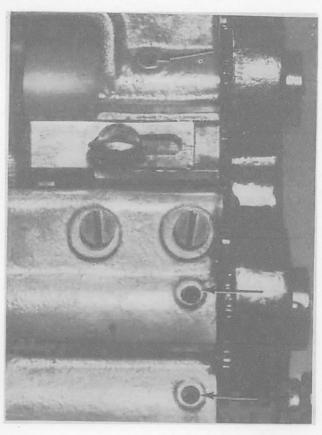
Jb. FREQUENCY. The intervals between the preventive maintenance services listed here are con-



Figlire 167. Feed rofl and cnfter shaft bearillgs-right side.

si lered a m11111111um requirement for . the normal operation of the machine.

- c. FIRST ECHELON PARTICIPATION'. The operator should assist the unit mechanic while second echelon maintenance services are performed on his machine.
- d. PROCEDURES. (1) W eeMy. The following maintenance services will be performed weekly:
- (a) Screws and nuts. Check tightness of all screws and nuts on the machine. If adjusting screws are loose. make sure that they are properly positioned when tightened.
- (b) Sliiver. Turn hand crank and run piece of crap leather through skiver. Check feeding action of feed rolls. Check condition of cutting edge of sk iver blade. If dull, remove blade, pharpen it (par. 156), and replace blade in position.
- (c) Sale cutter. See that cutt er blade and feed wheel are firmly secured to driving shafts. The cutter blade should be positioned betwen the cutter feed wheel and the cutter work roll. Turn hand crank and feed a piece of leather into the cutting



Fignre 168. Driving gears.

wheels. The cut should be distintt and the leather hould part without feathering.

(2) Monthly. No monthly service prescribed.

Section XII. TROUBLE SHOOTING

15 I · General

This section contains trouble-shooting information which can be helpful in determining the causes of trouble that may develop in the cutter and skiver machine.

152. Skiving Difficulties

The principal symptoms of trouble are failure to feed and un even skiving. Paragraph 153 lists the causes for failure to feed and their remedies. Paragraph 154 lits the causes for uneven skiving and their remedies.

153. Causes and Remedies for Failure to Feed

Possible cause	Remedy
Improper position of feed wheels.	See that feed rolls are securely attached to feed roll drive shafts. Feed rolls should be set 3/32 inch apart. Ad just to that position with adju ting cap screw passing through fork in rear of machin e.
Skiver blade set too far forward, jamming leather between feed rolls.	Adjust screw at rear of blade to bring cutting edge of blade forward to within 1/64 inch of forward stop. A blade becomes shorter from sharpening, position of adjusting screw must be changed to bring blade farther forward.

154. Causes and Remedies for Uneven Skiving

Possible cause	Remedy		
Dull sk iver blade	Remove skiver blade and sharpen it. (See par 156.)		
Skiver blade et at improper angle to rolls.	Inside cutting edge of blade shou Jd clear the top feed roll about 1/32 inch. Outside cut- ting edge should clear the bottom feed roll a scant 1/32 inch.		
Unevenly sharpened skiver blade.	Remove blade and sharpen correctly. (See par. 156.)		

Section XIII. SECOND ECHEL ON MAINTENANCE

155. General

This section is devoted to the maintenance of cutter and skiver machines which second echelon maintenance units are authorized to perform. The maintenance unit of the using organization may completely disassemble these simple machines. In actual practice, however, complete disasse1nJ)ly of these machines is seldom necessary.

156. Sharpening Skiver Blade

The skiver blade should be stoned on both sides so that the finished cutting edge is in the center of the 1 hicknes of the blade. Sharpen the blade on a stone either of a fine grade or of a combination of medium and fine grade. If the blade must be ground down a great deal, initial grinding should be done on a

. lone of medium grade. Hold the blade slightly in exces of the angle of the exi ting bevel ground on the stone. Stone first one ide, then the other, main-taining proper stoning angle. until the blade has been stoned to a keen slightly "f eather" edge. The feather edge may be removed by stoning the blade in a cir cular motion on a tone of fine grade, or by stropping the blade on leather or wood. The sharpened edge of the skiYer blade should be traight and uni formly beveled.

157. Replacement of Skiver Feed Rolls (fig. 160)

a. REMOVAL. Remove skiver top roll retammg screw. Remove skiver top roll (5, fig. 160) from the driving shaft. Remove skiver bottom shaft re-tammg shoe. Loosen retaining screw 111 skiver bottom roll. (See 3, fig. 160.) Remove skiver

bottom roll from driving shaft.

b. IN TALLATION. P lace skiver bottom roll (3) on bottom roll driving shaft. Secure retaining screw in skiver bottom roll. Install skiver bottom shaft retaining shoe. Place skiver top roll (5) on top roll driving shaft. Secure skiver top roll retain- mg screw.

158.Replacement of Cutter Blade and Feed Wheel(fig. 160)

a. REMOVAL. Remove retammg screws securing sole cutter work support roll (17, fig. 160) to sole cutter feed wheel (16). Remove cutter work support roll. Remove ole cutter blade guard retaining screw. Remove sole cutter blade guard (19). Pla ce shank wrench on shank of cutter blade between blade and upper cutter arm. Turn top of tr immer blade forward until t rimm er i turned off the cutter blade driving haft. Place shank wrench on shank of sole cutter feed wheel (16) between the cutter feed wheel and the lower cutter arm. Turn the top of the cutter feed wheel to the rear until it is turned off the cutter feed wheel driving shaft.

b. I NSTALLATION. Place cutter feed wheel (16) on end of cutter feed wheel driving shaft. Use the shank wrench to turn the top of the cutter feed wheel forward until it is secure on the driving shaft. Place the cutter blade (18) on the end of the cutter blade driving shaft. Use the shank wrench to turn the top of the cutter blade to the rear until it is secure on the driving shaft. Put the sole cutter blade guard (19) in place over the sole cutter blade. Secure the blade guar d to the upper cutter arm with the blade guard retaining screw. Place the sole cutter work support roll (17) on the sole cutter feed wheel, and secure the work support roll to the feed wheel with work support roll re taining screws.

PART FOUR AUXILIARY EQUIPMENT

(Cutter and skiver machines for military use contain no attachments or parts which are not integral parts of the machine. Therefore they have no equip-

ment which may be classified as auxiliary equipment.)

PART FIVE REPAIR INSTRUCTIONS

(Becau e of the simplicity of their design, cutter and skiver machines are repaired with the tools and by the mechanics of the using organization. Repair

of the components of the cutter and skiver machines is therefore covered in part three.)

Part 2

Operation, Maintenance & Repair Landis Model 25 & 14 Pilgrim Model 25

Sole Skiver, Beveler & Trimmer Machines Table of Contents

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DISCLAIMER

This manual is offered as a guide to shoe makers in the care and maintenance of their equipment. Pilgrim Shoe & Sewing Machine offers no guarantee as to the accuracy of this manual. If you are in doubt of your ability to undertake a repair to your machine, call a professional shoe machine mechanic.

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PART THREE

SOLE SKIVER AND BEVELER AND TRIMMER MACHINES

CHAPTER 11

Section I. GENERAL

121. Scope

Part three of this manual contains instructions and information on the operation, maintenance, and repair of the sole skiver and beveler and sole trimmer machines designed to cut and shape new leather soles used in shoe repair.

a. Sole Skiver and Beveler Machine. These instructions are based on the Landis Model 14 sole skiver and beveler machine (FSN 3520-359-8614) used to skive (shave down) the shank of the sole and also to cut a beveled edge around the bottom of a sole.

b. Sole Trimmer Machine. These instructions are based on the Landis Model 25A sole trimmer machine (FSN 3520-359-7598) used to cut soles from leather strips and to trim applied soles before they are stitched.

123. Forms, Records, and Reports

The forms and reports listed in paragraph 3 apply also to the sole skiver and beveler and sole trimmer machines and will be used accordingly.

124. Orientation

Throughout part three, the terms right, left, front, and rear indicate directions from the viewpoint of the operator facing the machines and in an operating position.

Section II. DESCRIPTION

125. Sole Skiver and Beveler

The sole skiver and beveler (fig. 108) is a hand-operated machine, set, for operational purposes, in a bracket on a fender of the trailer. The machine is equipped with two feed rolls and a cutting knife (16). The upper roll (3) and the lower roll (10) hold the leather in place and turn with the action of the handcrank (8) on the roll shafts. As the rolls turn, they feed the leather to the knife, which skives or shaves down the shank or rear portion of a half sole; at the same time, the slant of the knife bevels or tapers the leather

at the proper angle to blend smoothly with the shank of the sole. The top feed roll is smooth at the left end to bevel evenly or thin down the sole at its outer edge in the event it is too heavy for the stitching machine.

126. Sole Trimmer

The sole trimmer (fig. 109) is a handoperated machine. For operational purposes, it is set in a bracket on a fender of the trailer. The sole trimmer is equipped with a cutting blade (1), a work support roll (12), and a feed wheel (11) attached to two shafts turned by a handcrank (9). As the shafts turn, the

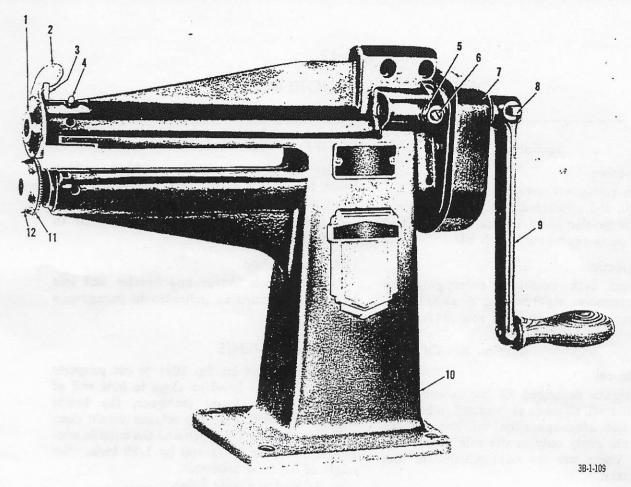


- Upper roll retaining screw washer
 Upper roll retaining screw
 Upper roll
 Work gage
 Work gage screw washer
 Work gage screw
 Gear guard
 Crank assembly
- 1 2 3 4 5

- Base
- 10 Lower roll
 - Fork
- Knife table link eccentric Knife table link Knife table
- 13
- 1:4 15
- Knife fastening screw
- Knife

Figure 108. Sole skiver and beveler.

leather, guided by the operator, moves between the feed wheel and the cutting blade. The blade guard (2) may be raised or lowered, depending upon whether a broad strip of leather is to be cut or excess material is to be trimmed from the edge of the shoe before stitching.



- Cutting blade
 Blade guard
 Blade guard spring post
 Blade guard latch plunger handle
- Handcrank setscrew nut
- Handcrank setscrew

- Gear guard Crank assembly setscrew Crank assembly Base Feed wheel 789
- 10
- Work support roll

Figure 109. Sole trimmer.

CHAPTER 12

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

127. Cleaning

Remove rust-preventive compound from all nuts, bolts, and unpainted surfaces on the sole skiver and beveler and trimmer machines and clean all parts thoroughly with SD.

128. Inspection

a. Inspect both machines thoroughly for proper assembly, tightness, and cleanliness. Check feed rolls and knife of sole skiver and beveler for good condition. Check cutting blade, feed wheel, and work support roll of sole trimmer for good condition.

b. Correct all deficiencies as indicated in paragraph 18.

129. Lubrication

Lubricate sole skiver and beveler and sole trimmer machines as indicated in paragraphs 138 and 139.

Section II. OPERATIONAL ADJUSTMENTS

130. General

Adjustments described in paragraphs 131 through 134 will be made as required in before, during-, and after-operation services. These adjustments apply only to the sole skiver and beveler. There are no adjustments for the sole trimmer.

131. Setting Forward Position of Knife

A fork shoulder (3, fig. 110) on the sole skiver and beveler provides a forward location for the knife (4) and prevents the knife from jamming the feed rolls (3 and 10, fig. 108). Set knife slightly away from fork shoulder as follows:

- a. Loosen 2 knife locking screws (2, fig. 110) so blade will slide easily.
- b. Hold knife against shoulder and turn knife adjusting screw (7) until the head just touches knife.
- c. Back off screw one-eighth turn and hold knife back firmly against screw while tightening knife locking screws.

132. Setting Angle of Knife

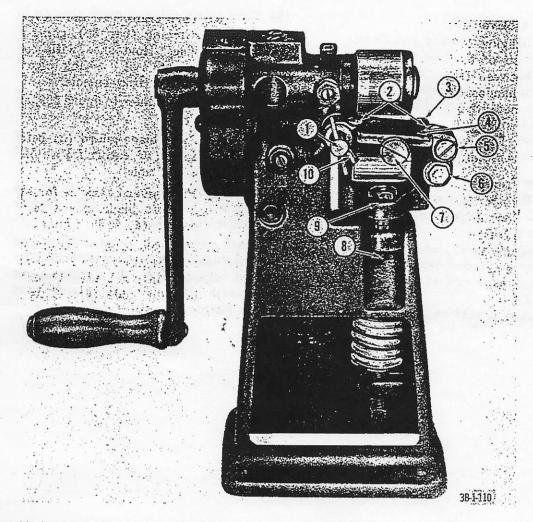
The knife (4, fig. 110) must be set at an angle with the blade clearing both upper and lower

feed rolls (3 and 10, fig. 108) to cut properly and give correct bevel or slope to butt end of half sole. For Army footwear, the inside edge of the knife near the column should clear the upper roll by 1/32 inch and the outside edge should clear the lower roll by 1/32 inch. Set angle of knife as follows:

- a. Adjusting Inside Edge.
 - (1) Loosen T-handle binding screw (1, fig. 110).
 - (2) Turn knife table long eccentric by indicator pin (10) until pin is in the position shown in figure 110.
 - (3) Tighten binding screw.
- b. Adjusting Outside Edge.
 - (1) Loosen table link short eccentric screw (5).
 - (2) Turn table link short eccentric (6) until clearance indicated above is reached.
 - (3) Tighten eccentric screw.

133. Setting Feed Rolls

Upper and lower feed rolls (3 and 10, fig. 108) must be set close together to hold and feed leather to the knife. The lower roll should be set from 3/32 inch to 1/8 inch below the



- Knife table long eccentric T-handle binding screw
- Knife locking screws Fork shoulder 3
- Knife
- Table link short eccentric screw

- Table link short eccentric Knife adjusting screw

- Fork adjusting screw locknut
- 10 Knife table long eccentric indicator pin

Figure 110. Sole skiver and beveler adjustments.

upper roll. Adjust lower roll as follows:

- a. Loosen fork adjusting screw locknut (9, fig. 110).
- b. Turn fork adjusting screw (8) until the proper distance is reached.
 - c. Tighten locknut.

134. Setting Work Gage

Set work gage (4, fig. 108) so knife (16) will cut a 3/4-inch skive as follows:

- a. Loosen work gage screw (6).
- b. Slide gage to required position.
- c. Tighten screw.

Section III. **OPERATION**

135. General

Operation of the sole skiver and beveler and the trimmer machines will normally be the same under usual and unusual conditions. Their simple designs and slow operating speeds

make these machines relatively unaffected by unusual operating conditions if proper lubrication (pars. 138 and 139) and preventive maintenance services (pars. 141 through 143) are performed.

136. Sole Skiver and Beveler

Refer to figure 108, and proceed as follows: a. Set butt of half sole against work gage (4) and between feed rolls (3 and 10).

b. Turn handcrank (8), and guide, but do not force, the leather as it is pulled by the rolls against the knife (16).

c. Allow leather to clear rolls before removing from knife table (14).

137. Sole Trimmer

a. Trimming. Refer to figure 109, and proceed as follows to trim excess material from edge of sole before stitching:

(1) Raise blade guard (2) and insert outsole as far as needed, resting outsole on work support roll (12) and feed wheel (11).

(2) Allow guard to rest on outsole.

- (3) Turn crank (9) and move shoe as in stitching (par. 30), going around the shoe. Hold shoe with bottom level except at shank to prevent undercutting outsole.
- b. Cutting. Refer to figure 109, and proceed as follows:
 - (1) Raise blade guard (2) before cutting a strip of leather for a full sole or for a half sole.
 - (2) Press guard back as far as it will go and set blade guard latch plunger handle (4) to lock guard.
 - (3) Mark position of cut on leather and insert leather between feed wheel (11) and cutting blade (1) until mark is beneath blade (4). Turn crank and cut leather.

CHAPTER 13 ORGANIZATIONAL MAINTENANCE

Section I. LUBRICATION

138. Lubrication Charts

a. Lubrication charts for the sole skiver and beveler (fig. 111) and sole trimmer (fig. 112) prescribe lubrication points, intervals, procedures, and lubricants for these machines.

b. Intervals specified in the lubrication charts are for normal operating conditions and continuous use of equipment. Time between intervals should be reduced under extreme temperature conditions or prolonged periods of

operation in sandy or dusty areas. Time between intervals may be extended when equipment is not in continuous service.

139. Specific Instructions

a. Lubrication fittings and oilholes can be located by reference to the lubrication charts.

b. Wipe lubrication points and surrounding surfaces clean before applying lubricant. Clean all parts with SD and let parts dry thoroughly before applying lubricant.

Section II. PREVENTIVE MAINTENANCE

140. Responsibility

The preventive maintenance services are a function of the using organization. These services consist of before-, during-, and after-operation services.

141. Before-Operation Service

- a. Sole Skiver and Beveler.
 - (1) Make sure machine has not been tampered with or damaged since last operation.
 - (2) Turn crank and observe for proper gear mesh and easy turning of feed rolls on their shafts.
 - (3) Check for proper setting of rolls and knife.
 - (4) Make sure knife blade is sharp enough.
 - (5) Lubricate machine (pars. 138 and 139).
 - (6) Report any unsatisfactory condition that cannot be corrected.
- b. Sole Trimmer.
 - Make sure machine has not been tampered with or damaged since last operation.

- (2) Turn crank and observe for proper gear mesh and proper turning of cutting blade and feed wheel on their shafts.
- (3) Make sure cutting blade, feed wheel, and work support roll are properly attached to shafts and that cutting blade is sharp enough.
- (4) Check blade guard latch plunger handle for proper operation.
- (5) Lubricate machine (pars. 138 and 139).
- (6) Report any unsatisfactory condition that cannot be corrected.

142. During-Operation Service

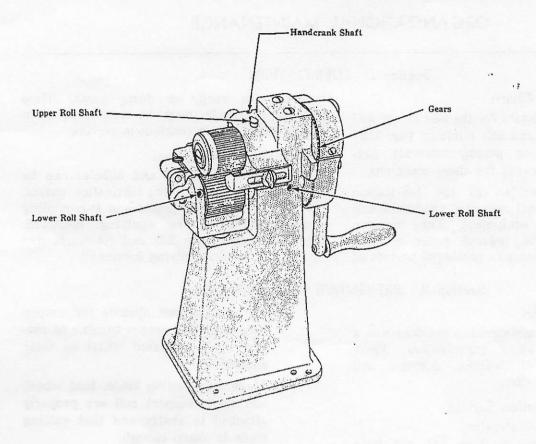
- a. Sole Skiver and Beveler. Observe action of machine to make sure rolls feed properly and that knife is cutting proper skive sharply and cleanly.
- b. Sole Trimmer. Observe action of machine to make sure it is feeding properly, that cutting blade is cutting cleanly and sharply, and cutter guard is holding its position.

LUBRICATION CHART

SOLE SKIVER AND BEVELER (LANDIS MODEL 14)

Intervals given are maximums for normal operation. For abnormal conditions or activities, intervals should be shortened to compensate. Extend when not in use.

Clean all parts with Solvent, dry-cleaning (SD). Dry before lubricating. For intervals and lubricants refer to KEY.



KEY

LUBRICANT	ALL TEMPERATURES	INTERVALS
OE-Lubricating Oil, Internal Combustion Engine	OE-10	Daily

3B-1-111

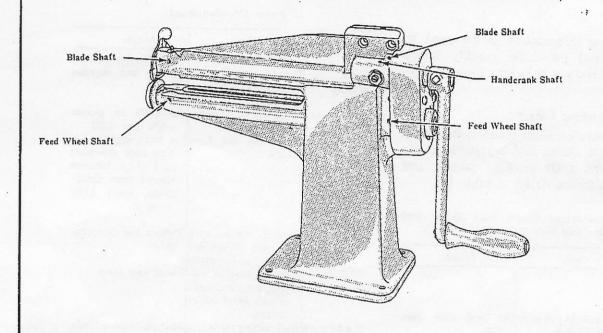
Figure 111. Lubrication chart, sole skiver and beveler.

LUBRICATION CHART

SOLE TRIMMER AND CUTTER (LANDIS MODEL 25A)

Intervals given are maximums for normal operation. For abnormal conditions or activities, intervals should be shortened to compensate. Extend when not in use.

Clean all parts with Solvent, dry-cleaning (SD). Dry before lubricating. For intervals and lubricants refer to KEY.



-KEY-

LUBRICANT	ALL TEMPERATURES	INTERVALS
OE—Lubricating Oil, Internal Combustion Engine	OE-10	Weekly

3B-1-112

Figure 112. Lubrication chart, sole trimmer.

143. After-Operation Service

- a. Sole Skiver and Beveler.
 - Check condition of knife, and sharpen if necessary.
 - (2) Make any necessary adjustments of positions of knife or feed rolls.
 - (3) Lubricate as required.
 - (4) Clean machine with a cloth and SD.
 - (5) Report any deficiencies that cannot be corrected.

b. Sole Trimmer.

- (1) Check condition of cutting blade, and install new one if necessary.
- (2) Make sure that cutting blade, feed wheel, and work support roll are properly attached to their shafts.
- (3) Clean all parts with a cloth and SD.
- (4) Lubricate as required.
- (5) Report any deficiencies that cannot be corrected.

Section III. TROUBLESHOOTING

144. General

Troubleshooting information is designed to help organizational personnel quickly locate and correct any troubles that may develop during operation.

145. Troubleshooting Chart

Some of the more common troubles that may develop in the sole skiver and beveler and sole trimmer machines, their possible causes, and suggested remedies are listed in table III.

Table III. Troubleshooting Chart, Sole Skiver and Beveler and Sole Trimmer

Trouble	Cause	Remedy
Sole skiver and bev- eler: Failure to feed.	Feed rolls too close or too far apart. Blade too far forward, jamming leather be-	133).

Table III-Continued

Trouble	Cause	Remedy
Uneven skiving.	sharpened skiver knife.	
	angle.	Set knife to proper angle (par. 132). Set knife slightly behind fork shoulder; as knife becomes shorter from sharpening, move knife forward.
C.1. t.:		lorward.
Sole trimmer: Improper feeding.	Cutting blade, work support roll, and feed wheel loose on shafts	
	Serrated edge of cut- ting blade and teeth of feed wheel dull or broken.	Install new parts.
		Sharpen cutting blade.
to cut or trim properly.		

Section IV. UNIT MAINTENANCE

146. Responsibility

Services in paragraphs 147 and 148 are the responsibility of the using organization in addition to those adjustments noted as a responsibility of the operator (pars. 131–134). Services and repairs beyond those detailed to the operator or unit mechanic should be reported for referral to higher echelon maintenance.

147. Skiver Knife

a. Removal and Installation. Refer to figure 110, and proceed as follows:

- (1) Loosen locking screws (2) and adjusting screw (7) enough to slide knife (4) from table.
- (2) Reverse procedure in step (1) above to install knife.
- (3) Adjust knife (pars. 131 and 132) before tightening locking screws.

b. Sharpening.

- (1) Regrind very blunt knife before knife is stoned.
- (2) Grind knife on both sides so finished cutting edge is in center of thickness of blade.

- (3) Use fine grade grinding stone or one of combination medium and fine grades.
- (4) When much grinding is required, perform initial grinding on medium grade stone.
- (5) When grinding is complete, stone knife on top side only, holding blade slightly in excess of angle of existing bevel (aprx. 10° from centerline of knife).
- (6) Stone knife to feathered edge that is straight and uniformly beveled.
- (7) Remove feather edge by stoning knife in circular motion on fine grade stone

or by stropping knife on leather or wood.

148. Trimmer Cutting Blade

- a. Remove blade by backing off in same direction blade turns when cutting; blade turns clockwise and is backed off clockwise.
- b. Use punch to loosen blades by inserting punch in hub.
 - c. Install blade by screwing blade on shaft.
- d. The blade is serrated to aid in feeding, and blade must be sharp for good results.
- e. Sharpen blade by holding sharpening stone on beveled side of blade at approximately same angle while turning handcrank.
 - f. Remove wire edge on flat side of blade.

CHAPTER 14

FIELD AND DEPOT MAINTENANCE

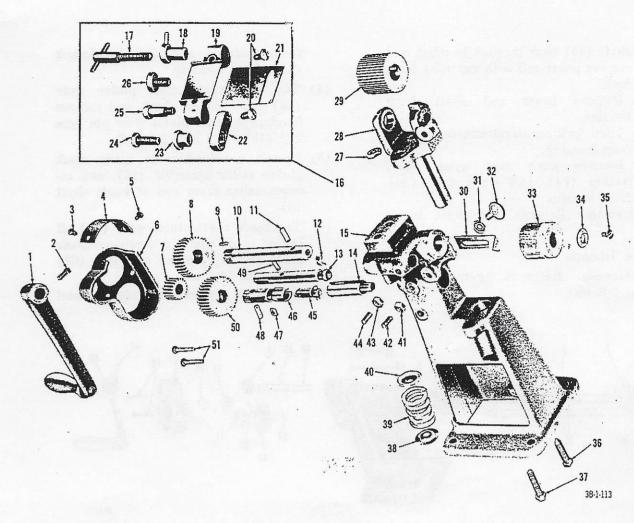
149. General

Instructions for complete disassembly of the sole skiver and beveler and sole trimmer are contained in paragraphs 150 and 151. When inspection indicates that only such components as the crank assembly or knife assembly need replacement or repair, simplicity of design allows for removal without special instructions.

150. Sole Skiver and Beveler

- a. Disassembly. Refer to figure 113, and proceed as follows:
 - (1) Remove setscrew (2) from handcrank assembly (1), and remove handcrank assembly from end of handcrank shaft (13).
 - (2) Remove 2 screws (51) from housing (15), and remove gear guard (6) from housing.
 - (3) Take out 2 screws (3 and 5) from gear guard, and remove cover plate(4) from gear guard.
 - (4) Remove handcrank shaft retaining screw locknut (43) from retaining screw (44), and remove retaining screw from housing.
 - (5) Slide handcrank shaft from housing, and remove shaft retaining shoe (12) from shaft.
 - (6) Tap handcrank shaft pinion gear (7) off of shaft, and remove shaft pinion gear pin type key (49) from hole in shaft.
 - (7) Take out upper roll retaining screw (35) from end of upper roll shaft (10), remove retaining screw washer (34), tap upper roll (33) from shaft, remove upper roll key (11) from hole in shaft, and slide shaft (10) from housing.

- (8) Tap upper roll gear (8) from upper roll shaft, and remove shaft gear pin type key (9) from groove in shaft.
- (9) Remove knife table long eccentric binding screw (17) from housing, and remove long eccentric assembly (18) from knife table (19).
- (10) Unscrew knife table link eccentric binding screw (24) from housing, remove link eccentric (23) from knife table link (22), remove knife table connecting screw (25) from knife table link, and remove knife table link.
- (11) Remove knife adjusting screw (26) from knife table, slide knife (21) from knife table, and unscrew 2 knife fastening screws (20) from knife table.
- (12) Remove from housing the fork pressure spring adjusting screw (36), spring cup washer (40), fork pressure spring (39), and spring cup washer (38).
- (13) Unscrew fork adjusting screw locknut (27) from fork adjusting screw (37), and remove fork adjusting screw from fork (28).
- (14) Remove lower gear shaft retaining shoe screw locknut (41) from shoe screw (42), and remove shoe screw from housing.
- (15) Remove lower gear shaft (46) from housing, remove shaft retaining shoe (47) from shaft, tap lower gear (50) from shaft, and remove lower gear assembly key (48) from hole in shaft.
- (16) Slide lower roll shaft driving link (45) from opening in housing.
- (17) Use brass drift to punch lower roll



- Handcrank assembly with handle Setscrew
- 3 Screw Cover plate 4
- 5 Screw
- 6 Gear guard
- Handcrank shaft pinion gear
- Upper roll gear 8
- 9 Upper roll shaft gear pin type key
- 10 Upper roll shaft
- Upper roll key 11
- 12 Handcrank shaft retaining shoe
- Handcrank shaft 13
- Lower roll shaft
- 15 Housing
- 16 17 18 19
- Knife table assembly
 Knife table long eccentric binding screw
 Knife table long eccentric assembly
 Knife table

- 20 Knife fastening screws
- 21 Knife
- Knife table link Knife table link eccentric
- Knife table link eccentric binding screw
- Knife table connecting screw
- Knife adjusting screw

- 27 Fork adjusting screw locknut
- 28 Fork
- 29 Lower roll with key
- 30 Work gage
- 31 Work gage screw washer
- Work gage screw 32
- 33 Upper roll
- 34 Upper roll retaining screw washer
- 35 Upper roll retaining screw
- 36 Fork pressure spring adjusting screw
- 37 Fork adjusting screw
- 38 Fork pressure spring cup washer
- 39 Fork pressure spring
- Fork pressure spring cup washer 40
- 41 Lower gear shaft retaining shoe screw locknut
- 42 Lower gear shaft retaining shoe screw
- Handcrank shaft retaining screw locknut 43
- Handcrank shaft retaining screw Lower roll shaft driving link 44
- 45
- 46 Lower gear shaft
- Lower gear shaft retaining shoe Lower gear assembly key 47
- 49 Handcrank shaft pinion gear pin type key
- Lower gear assembly
- 51 Screws

Figure 113. Sole skiver and beveler, exploded view.

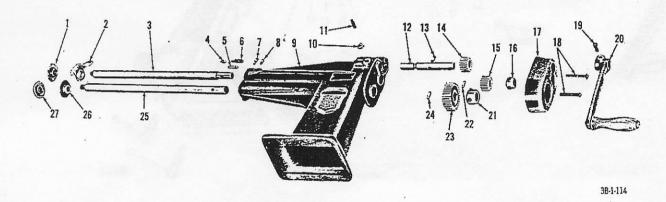
shaft (14) back through housing, and remove lower roll with key (29) from fork.

- (18) Remove lower roll shaft from housing.
- (19) Turn fork counterclockwise, and lift from housing.
- (20) Remove work gage screw (32), washer (31), and work gage (30) from housing.
- b. Reassembly. Reverse procedure in a above.

151. Sole Trimmer

a. Disassembly. Refer to figure 114, and proceed as follows:

- from housing, and slide handcrank shaft from housing.
- (4) Tap handcrank shaft pinion gear (14) from end of shaft, and remove handcrank shaft pinion gear pin type key (13) from hole in shaft.
- (5) Loosen 2 setscrews in blade shaft pinion collar assembly (16), and remove collar from end of blade shaft (3).
- (6) Tap blade shaft pinion gear (15) off end of blade shaft, and remove blade shaft pinion gear pin type key (22) from hole in shaft.
- (7) Loosen 2 setscrews in feed wheel



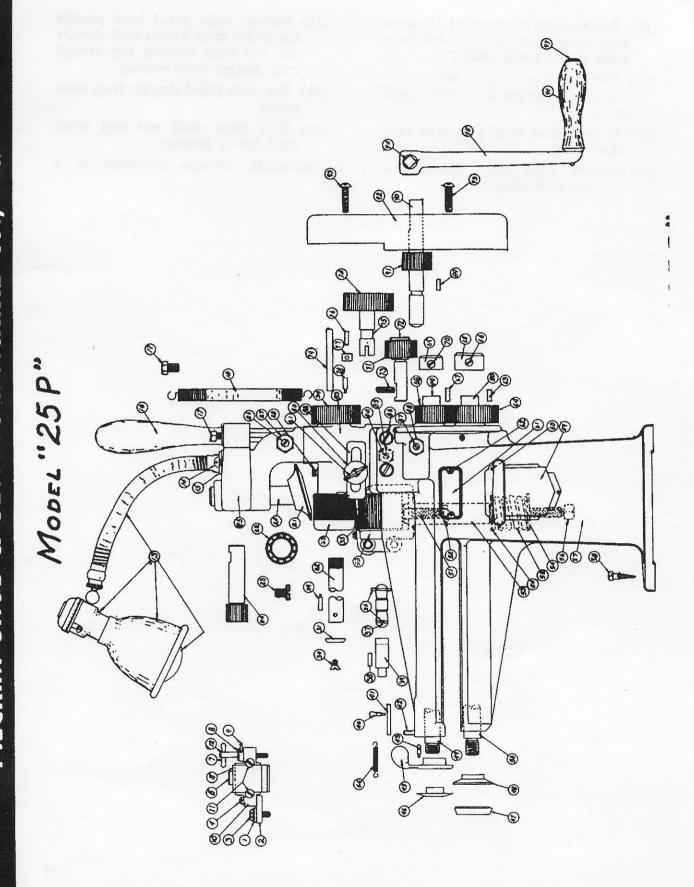
- 1 Blade
 2 Blade guard
 3 Blade shaft
 4 Blade guard stop pin
 5 Blade guard latch plunger
 6 Blade guard spring
 7 Blade guard spring post
 8 Blade guard latch plunger handle
 9 Housing
 10 Handcrank shaft screw nut
 11 Handcrank shaft screw
 12 Handcrank shaft
 13 Handcrank shaft
- 12 Handcrank shaft pinion gear pin type key 14 Handcrank shaft pinion gear
- 15 Blade shaft pinion gear
 16 Blade shaft pinion collar assembly with setscrews
 17 Gear guard
 18 Gear guard screws
 19 Crank assembly setscrew
 20 Crank assembly with handle
 21 Feed wheel shaft gear collar assembly with setscrews
 22 Blade shaft pinion gear pin type key
- 23 Feed wheel shaft gear 24 Feed wheel shaft gear pin type key 25 Feed wheel shaft
- 26 Feed wheel 27 Work support roll

Figure 114. Sole trimmer, exploded view.

- (1) Remove crank assembly setscrew (19) from crank assembly (20), and remove crank assembly from end of handcrank shaft (12).
- (2) Take out 2 gear guard screws (18) holding gear guard to housing (9), and remove gear guard (17).
- (3) Remove handcrank shaft screw nut (10) from screw (11), remove screw
- shaft gear collar assembly (21), and remove collar from end of feed wheel shaft (25).
- (8) Tap feed wheel shaft gear (23) from end of feed wheel shaft, and remove feed wheel shaft gear pin type key (24) from hole in shaft.
- (9) Unscrew work support roll (27) from end of feed wheel shaft.

- (10) Remove blade guard spring (6) from blade guard stop pin (4) and from blade guard spring post (7).
- (11) Unscrew blade (1) from blade shaft, and slide blade guard (2) off end of shaft.
- (12) Unscrew feed wheel (26) from feed wheel shaft.
- (13) Remove blade guard spring post from top of housing.
- (14) Remove blade guard latch plunger handle (8) from hole in latch plunger (5) and from housing, and remove latch plunger from housing.
- (15) Tap blade guard stop pin from blade guard.
- (16) Slide blade shaft and feed wheel shaft out of housing.
- b. Reassembly. Reverse procedure in a above.

PILGRIM SHOE & SEWING MACHINE CO., Inc.



1 SS SAINER FORM 1 SS FRANK SAINER 1 SS BATTON CARR 1 TO BLACK CARR S
N. 1. S. SAIVER FORM PROJECTIONS SAGEN MAY SE 1 S. SAIVER FORM PROSESSING SAGEN MAY SE 1 S. SAIVER FORM PROSESSING SAGEN MAY SE 1 S. SAIVER FORM PROSESSING SAGEN MAY SE 2 S. NAME FORM PROSESSING SAGEN S. SAIVER FORM FORM PROSESSING SAGEN S. RAME TO BETTOM SAFET PROSESSING SAGEN SERVER FORM TO BETTOM SAGEN SERVER MAYOR FORM FORM TO THIM SAGEN SERVER MAYOR FORM FORM TO THIM SAGEN SERVER MAYOR FORM FORM TO THIM SAGEN SERVER MAGEL SAGET FORM TO THIM SAGEN SERVER SAGET FORM TO THE SAGEN SERVER MAGEL SAGET FORM TO THE SAGEN SERVER SAGET FORM TO THE SAGEN SERVER SAGET FORM TO THE SAGEN SERVER MAGEL SAGET FORM FORM SAGET FORM TO THE SAGEN SERVER MAGEL SAGET FORM FORM SAGET FORM TO THE SAGEN SERVER MAGEL SAGET FORM TO SAGEN SERVER MAGEL SAGET FORM SAGET FORM TO SAGEN SERVER MAGE CAME SAGET FORM SAGEN SERVER MAGEL SAGET FORM SAGET FORM TO THE SAGEN SERVER MAGEL SAGET FORM TO SAGEN SERVER MAGEL S
N. 1 S. SINIAR FRANSTING SCREW S. 1 S. SINIAR FRANSTING SCREW S. 1 S. SINIAR FRAN PRESSURE SCREW MARKER S. 1 S. SINIAR FRAN PRESSURE SCREW S. 1 S. SINIAR FRAN PRESSURE SCREW S. 2 S. SINIAR FRAN PRESSURE SCREW S. 2 S. SINIAR FRANK SCREW SCREW S. 3 SINIAR FRANK SCREW SCREW S. 4 SANCK FRANK FRANK SCREW S. 4 SANCK FRANK FRANK SCREW S. 4 SANCK FRANK FRANK SCREW S. 5 SANCK FRANK FRANK SCREW S. 6 SANCK FRANK SCREW FRANK SCREW S. 6 SANCK FRANK SCREW FRANK SCREW S. 7 SANCK FRANK SCREW FRANK SCREW S. 1 SANCK FRANK SCREW FRANK SCREW S. SANCK FRANK SCREW FRANK S. SANCK FRANK SCREW FRANK S. SANCK GRAW FRANK S. SANCK FRANK SCREW FRANK S. SANCK FRANK SCREW SCREW S. SANCK FRANK SCREW SCREW S. SANCK FRANK SCREW SCREW S. SANCK GRAW FRANK S. SANCK FRANK SCREW SCREW S. SANCK GRAW FRANK S. SANCK FRANK SCREW SCREW S. SANCK GRAW FRANK S. SANCK FRANK S. SANCK FRANK S. SANCK FRANK S
Sincer Face Polisting Screw Sincer Face Pressure Spaine Borry Sincer Face Pressure Spaine Borry A Shiner Face Pressure Spaine Borry Sore Combination Getter Pressure Spaine Sincer Face Pressure Spaine Borry A Face Face Face Pressure Spaine Sarial Face Face Pressure Spaine A Face Wheel Barry Face Prime Sore of Waitfalle Sarial Face Face Prime Face Prime Face Wheel Shart Prime Face Wheel Chart Shart Farmine Share Face Face Face Why Face Chart Shart Prime Face Chart Shart Farmine Share Face Chart Shart Farmine Face Chart Face Face Face Face Face Face Face Face
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BOOK 4 PATCHING MACHINE

Singer Models

29K58, 29K60, 29K62, 29K70

Part 3

Operation, Maintenance & Repair Singer 29K-70 & 29K-71 Patching Machines

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DISCLAIMER

This manual is offered as a guide to shoe makers in the care and maintenance of their equipment. Pilgrim Shoe & Sewing Machine offers no guarantee as to the accuracy of this manual. If you are in doubt of your ability to undertake a repair to your machine, call a professional shoe machine mechanic.

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PART FOUR PATCHING MACHINE

CHAPTER 16 INTRODUCTION

Section I. GENERAL

156. Scope

a. Part four of this manual contains instructions and information on the operation, maintenance, and repair of the patching machine used to make stitching repairs on the leather uppers of shoes.

b. These instructions are based on the portable patching machine, Singer Sewing Machine Model 29K71 (FSN 3530-254-8386), but also apply to Singer Models 29K70 (FSN 3539-171-1716) and 29KSV19 (FSN 3530-171-2142), used with the mobile Shoe Repair Shop, Trailer-Mounted (par. 1).

157. Requisitioning

All tools and supplies should be requisitioned

158. Forms, Records, and Reports

The forms and reports listed in paragraph 3 apply also to the patching machine and will be used accordingly.

159. Orientation

Throughout part four the terms right, left, front, and rear indicate directions from the viewpoint of the operator facing the patching machine in an operating position.

Section II. DESCRIPTION

160. General

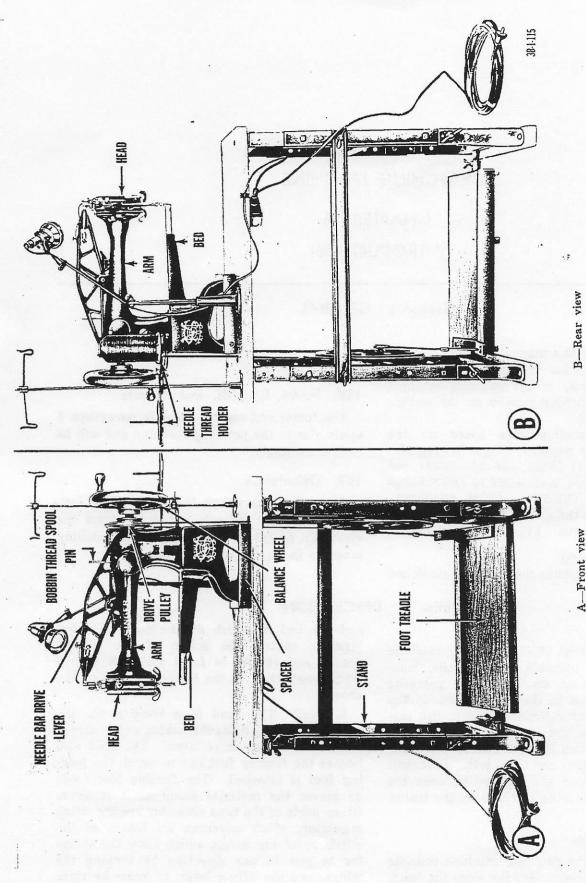
The Singer Model 28K71 patching machine (fig. 115) is a portable, single-needle, lock-stitch, foot-powered machine. The patching machine is carried in the rigging box on the trailer and for operational purposes the machine is removed and installed on a portable folding stand which includes the foot treadle, treadle-driven pulley and drive belt. In transit the stand is folded and carried between the generator and finishing machine on the trailer bed.

161. Components

a. General. The patching machine consists of three major assemblies; the arm, the head,

and the bed in which all the parts working together control the action of the thread, needle, and shuttle to form and lock a firm continuous stitch in the leather uppers of the shoe.

b. Head. The head is a housing for the needle bar which holds the needle, and is driven by the needle bar drive lever. The head also houses the feeding foot bar to which the feeding foot is attached. The feeding foot feeds or moves the material along as it is sewn. Other parts of the head assembly are the stitch regulator, which measures the length of the stitch, revolving wings, which allow the operator to sew in any direction by turning the wings, and the lifting lever, to lower or raise



A-Front view B-Re Figure 115. Patching machine.

the feeding foot when material is being inserted or removed.

c. Bed. The bed holds the threaded bobbin in the shuttle beneath the needle plate. The bed also contains the shuttle driving assembly, which turns the shuttle to match the action of the needle and its thread so a lockstitch may be formed when the thread is pulled from the bobbin.

d. Arm. The arm holds the drive shaft, which turns to set in motion the functional parts of the machine. These parts include the feed motion cam wheel, needle bar drive lever, and a cam. The feed motion cam wheel, at the left end of the drive shaft, controls action

authors to surprise the contract

of the feeding foot through movement of the feeding foot bar to which it is attached. The right end of the needle bar drive lever revolves in an eccentric race in the drive pulley to control action of the needle attached to the lower end of the needle bar. The cam revolves on a shaft in the right end of the arm, and controls action of the shuttle drive gears in the gearbox by a cam lever running down through the column.

162. Tools and Repair Parts.

A list of tools and supplies for the patching machine appears in paragraphs 204 and 205.

the feeding foot when material is being inserted or removed.

c. Bed. The bed holds the threaded bobbin in the shuttle beneath the needle plate. The bed also contains the shuttle driving assembly, which turns the shuttle to match the action of the needle and its thread so a lockstitch may be formed when the thread is pulled from the bobbin.

d. Arm. The arm holds the drive shaft, which turns to set in motion the functional parts of the machine. These parts include the feed motion cam wheel, needle bar drive lever, and a cam. The feed motion cam wheel, at the left end of the drive shaft, controls action

of the feeding foot through movement of the feeding foot bar to which it is attached. The right end of the needle bar drive lever revolves in an eccentric race in the drive pulley to control action of the needle attached to the lower end of the needle bar. The cam revolves on a shaft in the right end of the arm, and controls action of the shuttle drive gears in the gearbox by a cam lever running down through the column.

162. Tools and Repair Parts.

A list of tools and supplies for the patching machine appears in paragraphs 204 and 205.

Section III. OPERATIONAL ADJUSTMENTS

169. General

The patching machine can be adjusted to change length of stitch, position and lift of feeding foot, thread tension, and tension and movement of takeup lever to conform to different types of material being repaired. Once these adjustments are made for normal operation in the field for Army footwear, there is little need for further adjustment except for thread tension. Adjustments will be made as indicated in paragraphs 170 through 173.

170. Adjusting Length of Stitch

a. The length of the stitch depends upon thickness of material being repaired; a short stitch is used for heavy material and a long stitch for lighter material. The stitch regulator (fig. 116) regulates the length of the stitch by changing the number of stitches to the inch. A thumbscrew holds the regulator in position at the rear of the feeding foot bar. Each of the numbers stamped on the feed motion bell crank lever indicates the number of stitches that will be made per inch when the regulator is set at a particular point.

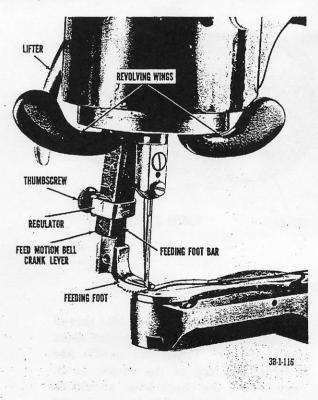


Figure 116. Stitch regulator.

b. Loosen thumbscrew, move regulator to desired point, and tighten thumbscrew to change length of stitch.

171. Adjusting Feeding Foot

a. Regulating Pressure on Material.

- Pressure of the feeding foot must only be heavy enough to feed the material being repaired; leather will require a heavier pressure than other materials.
- (2) Regulate pressure of feeding foot by adjusting presser spring bar adjusting nut (fig. 117). Tighten nut to increase pressure; loosen to reduce pressure.

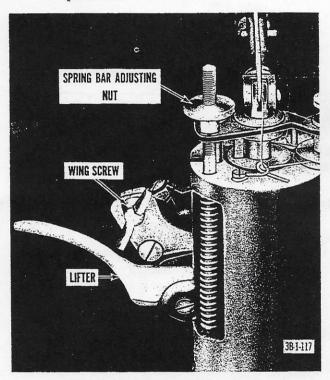


Figure 117. Feeding foot adjustments.

b. Regulating Automatic Feed Lift.

(1) During operation, the feeding foot rises after it has moved the work toward the rear of the machine, then the foot moves toward the needle and comes down again on the leather. The lift of the feeding foot should be only enough to clear the thickest part of the material passing under the needle.

(2) Adjust lift of feeding foot by pushing up on lifter (fig. 117) to raise foot. Loosen wing screw, then move screw forward to increase lift of foot or to rear to reduce lift, and tighten wing screw.

172. Adjusting Thread Tensions

Tension of needle and bobbin threads should be equal and strong enough to lock both threads in center of work (fig. 118). If tension of one thread is stronger than the other, an imperfect stitch will be formed.



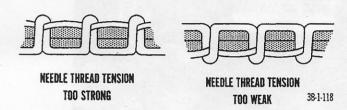


Figure 118. Effect of thread tension on stitch.

- a. Regulating Tension on Needle Thread.
 - (1) A correct stitch can usually be obtained by varying tension on the needle thread. This tension is controlled by tension disks (fig. 119) as the thread passes between them.
 - (2) Regulate tension between disks by turning thread tension stud thumb nut, turning nut to right to increase tension on thread and to left to lessen tension.
- b. Regulating Tension on Bobbin Thread. Tension of bobbin thread will rarely have to be adjusted; to adjust, tighten small screw in end of tension spring in side of the shuttle (fig. 120) to increase the tension, or loosen screw slightly to lessen tension.
- 173. Adjusting Thread Takeup Check Lever
 - a. Regulating Spring Tension.
 - (1) Spring tension on the thread takeup check lever (fig. 121) should be set to

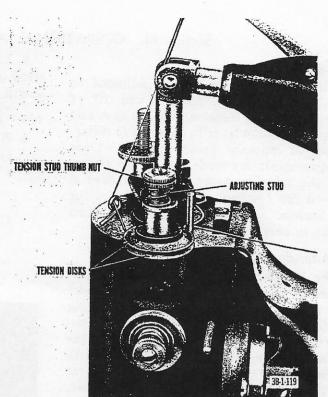
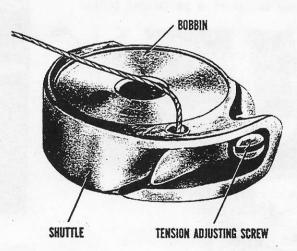


Figure 119. Thread tension adjustment



3B-1-120

Figure 120. Bobbin thread adjustment.

work together with the needle thread tension controlled by the tension disks (par. 172a). When the needle bar reaches the top of its stroke, as in figure 121, the check lever should be held down far enough by tension of

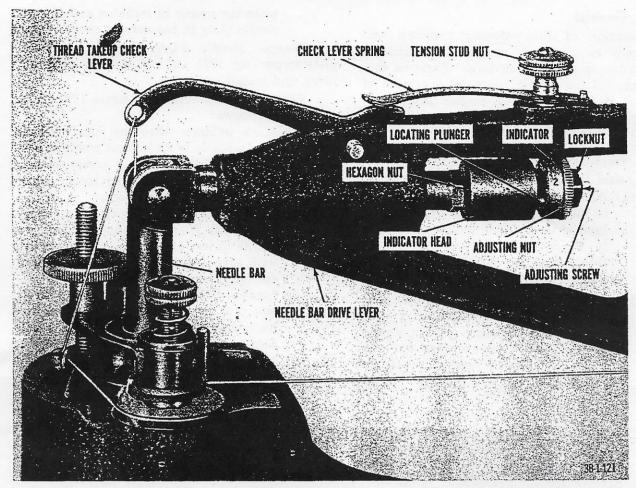


Figure 121. Thread takeup check lever adjustment.

the thread so the takeup action will keep the thread taut until the needle enters the work. With heavy material such as leather, tension on the check lever must be increased or decreased as needle thread tension in the tension disks is adjusted.

(2) Spring tension on the check lever is controlled by the check lever tension stud nut; to increase tension, tighten the nut and to decrease tension, loosen the nut.

b. Regulating Stroke.

(1) Different types of material need different amounts of thread in sewing operations. Heavy material such as leather requires more thread than thin material. The amount of thread fed through the needle bar is controlled by the length of the stroke (upand-down movement) of the takeup lever. This stroke is regulated by the regulator indicator adjusting nut (fig. 121); the barrel of this nut is marked from 0 to 4.

(2) For thin material, turn adjusting nut until zero mark is opposite locating plunger. For heavier materials such as Army footwear, turn nut to suit general thicknesses of materials and thread. Once this adjustment is made there will be little need for further adjustment.

Section IV. OPERATION UNDER USUAL CONDITIONS

174. General

Operation of the patching machine will normally be the same under any conditions which the operator can endure. Extreme conditions will have little effect on operation if thread is kept dry, and proper lubrication (pars. 178 and 179) and maintenance (pars. 180-189) are performed.

175. Preparation for Operation

- a. Select Proper Needle and Needle Plate.
 - (1) Needle selection. Size of needle to be used is determined by size and type of thread and weight of leather to be worked. Thread must pass freely through eye of needle for proper operation of machine.
 - (2) Needle plate selection. Two doubleend needle plates are furnished with the patching machine. Each needle plate (fig. 122) is marked at both ends with sizes of needles it will accommodate. Install proper needle

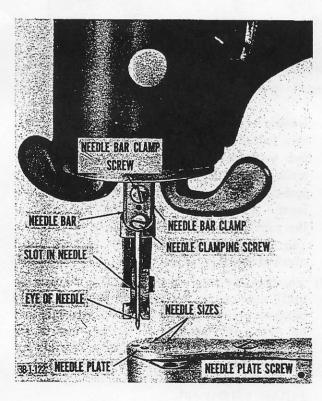


Figure 122. Setting needle.

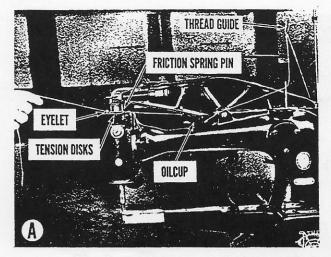
plate for needle to machine and place needle plate in the correct position.

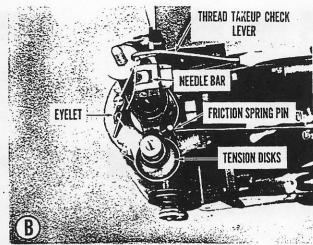
b. Change Needle Plate. Remove needle plate screw (fig. 122) and plate, install proper plate, and install screw.

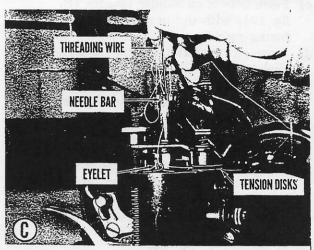
- c. Change Needle. Refer to figure 122, and proceed as follows:
 - (1) Move balance wheel by hand until needle bar is in its highest position.
 - (2) Loosen needle clamping screw, hold balance wheel with right hand, and remove needle from clamp.
 - (3) Insert new needle into clamp as far as it will go, with long groove in needle to left and eye directly in line with arm of machine. Tighten needle clamping screw.
 - (4) Loosen needle bar clamp screw, move clamp to right or left until needle can pass through center of needle plate hole when needle descends, and tighten clamp screw.

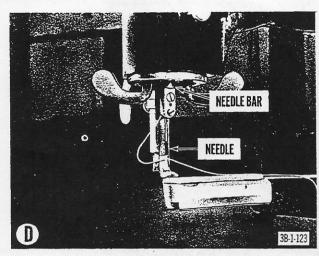
d. Thread Machine.

- (1) Place reel of thread on thread holder (B, fig. 115) so thread will draw from rear of spool. Bring thread over thread guide (A, fig. 123), then down through hole in bobbin thread spool pin.
- (2) Raise spring in oilcup, pass thread under spring, and press spring back into position.
- (3) Pass thread around back of friction spring pin (A and B, fig. 123), toward front to right of tension disks, and from right to left between disks.
- (4) Pass thread through wire eyelet (B, fig. 123) and through hole in end of thread takeup check lever from front to rear.
- (5) Draw 10 inches of thread through parts threaded in (2) through (4) above, and insert end of thread into slit in end of threading wire (C, fig. 123).
- (6) Pass wire from rear of takeup check lever down through needle bar.
- (7) When thread appears at hole in lower end of needle bar, remove thread from threading wire, and withdraw wire.









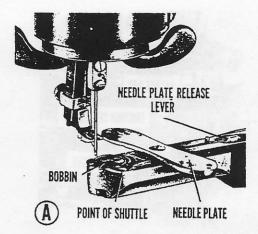
A—Passing thread from spool to oilcup and to friction spring pin
 B—Thread passing between tension disks

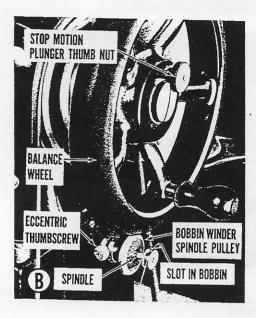
C—Passing thread down through head and needle bar D—Needle threaded

Figure 123. Threading machine.

- (8) Pass the thread through eye of needle from left to right (D, fig. 123) so thread extends 3 or 4 inches beyond needle.
- e. Service Bobbin. Before operation, and occasionally during operation, it will be necessary to remove bobbin, rewind it, thread shuttle, and replace bobbin.
 - (1) Remove bobbin. Refer to A, figure 124, and proceed as follows:
 - (a) Turn balance wheel by hand to raise needle to its highest position so that it clears needle plate.
 - (b) Raise lifter at rear of head to raise feeding foot.

- (c) Press down on needle plate release lever, and swing needle plate across shuttle driving gearbox.
- (d) Turn balance wheel until point of shuttle is to front, remove shuttle with bobbin, turn shuttle over, and release bobbin.
- (2) Adjust balance wheel. Refer to B, figure 124, and proceed as follows:
 - (a) Pull out on stop motion plunger, and turn plunger slightly to right or left to release balance wheel so wheel will run free of machine.
 - (b) Wind bobbin on bobbin winder((3) below).





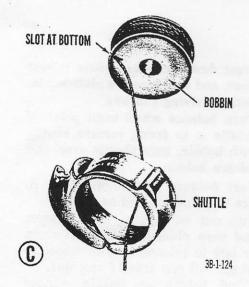


Figure 124. Bobbin service.

A-Bobbin and shuttle removal

B—Balance wheel adjustment and bobbin winding C—Thread dropped through shuttle

Figure 124-Continued.

(c) Turn stop motion plunger slightly while turning balance wheel slowly, and allow plunger to engage hole in inner disk.

(3) Wind bobbin.

- (a) Place spool of thread on bobbin thread spool pin on arm (A, fig. 115).
- (b) Place thread in small hole in hub of bobbin.
- (c) Place bobbin on winder spindle (B, fig. 124) with slot in slide of bobbin facing machine.
- (d) Turn eccentric thumbscrew to left, lower screw in its slot until rubber ring of spindle pulley presses against balance wheel, and tighten thumbscrew.
- (e) Turn balance wheel forward, guide thread with fingers so thread will wind smoothly, and cut thread between bobbin and spool when thread is just short of filling bobbin.
- (f) Remove bobbin from spindle, and pass end of thread into slot in edge of bobbin (C, fig. 124).
- (g) Loosen eccentric thumbscrew on winder, move screw up until rubber wheel ring does not touch balance wheel, and tighten thumbscrew.

(4) Thread shuttle.

- (a) Hold bobbin in right hand with slot in edge of bobbin at bottom (C, fig. 124). Allow 2 or 3 inches of thread to hang free from bobbin.
- (b) Hold shuttle in left hand with wide opening of shuttle at top. Allow end of thread to pass through shuttle.
- (c) Drop bobbin into shuttle, hold bobbin in shuttle, and turn shuttle over. Draw thread into slot in edge of shuttle and under end of tension spring and pass end of thread up through small hole in upper edge of shuttle (fig. 120).

- (5) Replace shuttle.
 - (a) Turn balance wheel until upright part of shuttle carrier is to right.
 - (b) Place shuttle and bobbin in place, with point of shuttle (A, fig. 124) to front and pointing to right.
 - (c) Place needle bar in its highest position, press needle plate release lever, and turn needle plate to sewing position.

f. Prepare Thread for Sewing.

- (1) Hold end of needle thread in left hand, leaving thread slack from hand to needle.
- (2) Turn balance wheel forward until needle moves down and up again to its highest point. Motion of needle will catch bobbin thread.
- (3) Pull end of thread that is being held; as thread tightens, bobbin thread will be brought up with it through needle plate (fig. 125). Lay both ends of thread back under feeding foot.

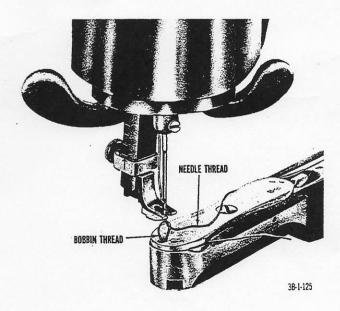


Figure 125. Thread prepared for sewing.

- g. Set Length of Stitch. Refer to paragraph 170.
- h. Adjust Feeding Foot. Adjust feeding foot for proper pressure and lift (par. 171).

- i. Check Thread Tension. Check thread tension and adjust if necessary (par. 172).
- j. Lubricate. Lubricate machine (pars. 178 and 179).
- k. Test. Test by sewing piece of scrap material to check for proper working order.

176. Operation

- a. Insert Material.
 - (1) Turn balance wheel forward to raise needle bar.
 - (2) Push lifter up to raise feeding foot.
 - (3) Insert material under feeding foot.
 - (4) Place 3 or 4 inches of thread to rear of feeding foot, and lower foot on material by bringing lifter down.
- b. Start Machine. Place both feet on treadle, turn balance wheel forward, move feet freely with motion of treadle until machine settles into a regular, easy movement.
 - c. Comemnce Sewing.
 - Guide material as it is moved along by the feeding foot; pulling or jerking on material may cause needle deflection and breakage.
 - (2) Direction of the stitch can be changed as desired. Use revolving wings (par. 166) to make a curved line of stitching. To turn a corner with the stitch, stop machine and turn balance wheel forward until feeding foot rises from material, then turn work as desired, using the needle as a pivot. The feeding foot may be adjusted to work in a straight line in any direction by tightening the setscrew on the face of the head of the machine (A, fig. 115). Do not turn the work or alter direction of feed while feeding foot is pressing on material; this may cause missed stitches and may damage the surface of the work.
- d. Remove Material. Raise needle bar to its highest position by turning balance wheel, and lift feeding foot by raising lifter. Draw material 3 inches back of needle and cut threads close to the work. Leave both ends of thread under feeding foot.

177. Precautions

To insure proper operation, observe following precautions:

a. Always turn balance wheel toward operator.

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- b. Feeding foot must be raised except when sewing.
- c. Do not work machine with shuttle and needle threaded unless there is material under feeding foot.
 - d. Avoid pulling material when stitching.

CHAPTER 18

ORGANIZATIONAL MAINTENANCE

Section I. LUBRICATION

178. Lubrication Chart

a. The lubrication chart (fig. 126) prescribes lubrication points, intervals, procedures, and lubricants for the patching machine.

b. The intervals specified in the lubrication chart are for normal operating conditions and continuous use of the equipment. Time between intervals should be reduced under extreme conditions, such as excessively high or low temperatures and prolonged periods of operation in sandy or dusty areas. Time be-

tween intervals may be extended when the equipment is not in continuous use.

179. Specific Instructions

a. Lubrication fittings, oilholes, and oilcup can be located by reference to the lubrication chart.

b. Wipe lubrication points and surrounding surfaces clean before applying lubricant. Clean all parts with SD unless otherwise specified. Let parts dry thoroughly before applying lubricant.

Section II. PREVENTIVE MAINTENANCE

180. Responsibility

The preventive maintenance services are a responsibility of the using organization. These services consist of before-, during-, and after-operation services.

181. Before-Operation Service

- a. Inspect for damaged, loose, or missing parts.
- b. Check needle and feeding foot to make sure they are properly set.
- c. If the needle is changed, make sure proper needle plate is installed, and that needle works into plate properly.
- d. Check bobbin for threading and cleanliness.
- e. Make sure needle thread is properly threaded.
 - f. Clean all parts.

- g. Lubricate machine (pars. 178 and 179).
- h. Make necessary adjustments of length of stitch, feeding foot, and thread tension.
- i. Operate machine with piece of scrap material to make sure machine operates correctly.
- j. Report any unsatisfactory condition that cannot be corrected.

182. During-Operation Service

- a. Clean dust, grit, and lint from shuttle.
- b. Oil shuttle each time bobbin is rewound.
- c. Make any necessary adjustments.

183. After-Operation Service

- a. Clean all parts of machine thoroughly; be sure to include shuttle and shuttle carrier.
 - b. Lubricate machine (pars. 178 and 179).
 - c. Rewind bobbin if necessary.
- d. Report any unsatisfactory condition that cannot be corrected.

LUBRICATION CHART

SHOE PATCHING MACHINE (SINGER SEWING MACHINE MODELS 29K71, 29K70, 29KSV19)

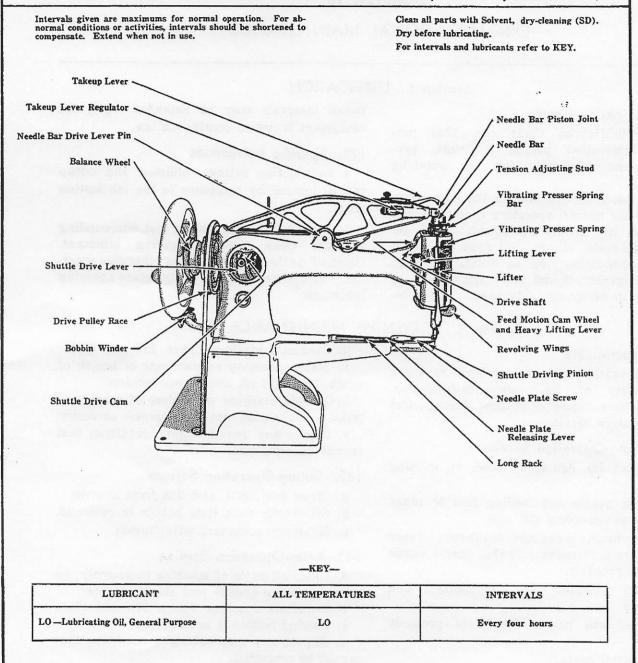


Figure 126. Lubrication chart, patching machine.

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Section III. TROUBLESHOOTING

184. General

Troubleshooting information is designed to help organizational personnel quickly locate and correct any troubles that may develop during operation.

185. Troubleshooting Chart

Some of the more common troubles that may develop in the patching machine, their possible causes, and suggested remedies are listed in table IV.

Table IV. Troubleshooting Chart, Patching Machine

Trouble	Cause	Remedy	
Broken needle	Needle loose in clamp.	Tighten clamping screw.	
	Needle of wrong size	Use proper size needle for work.	
	Feeding foot loose or out of line.	Adjust feeding foot properly and tighten setscrew.	
	Operator pulling on material.	Guide material; feeding foot moves material.	
	needle plate while	Raise needle bar to highest position be- fore moving needle plate.	
	Incorrect threading of machine.	Thread machine correctly (par. 175d).	

Table IV-Continued

Trouble	Cause	Remedy
	Thread tension too tight.	Adjust tension disks.
		Set needle properly (par. 175c).
	or tension spring.	Remove sharp edges with emery cloth.
	Needle rubbing against feeding foot.	Adjust and tighten feeding foot.
	Defective or incorrect size thread.	Use smooth, dry, even- ly twisted thread of proper size.
Broken bobbin thread.	Shuttle incorrectly threaded.	Thread shuttle correct- ly (par. 175e(4)).
	Bobbin wound too full	Wind thread on bobbin just below level of bobbin rims.
	Bobbin tension too tight.	Adjust tension (par. 172b).
		Rewind bobbin with correct thread ten- sion to lay smooth layers of thread.
	Shuttle sticky with oil or lint.	Clean shuttle and lu- bricate properly (pars. 178 and 179).
Skipping of stitch.	Needle thread fails to catch bobbin thread	
Drawing of seam.		Adjust thread tensions

Section IV. UNIT MAINTENANCE

186. Responsibility

Adjustments and replacements in paragraphs 187 through 189 are the responsibility of the using organization. These adjustments are operational in nature, but will not be performed by the operator.

187. Adjusting Thread Takeup Check Lever Regulator Indicator

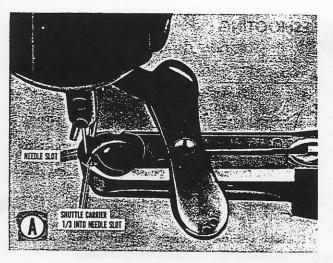
- a. Normal adjustment of the thread takeup check lever regulator indicator (par. 173b) will generally suffice for repair of Army footwear, but the range of the indicator can be increased by an adjusting screw (fig. 121).
- b. To alter range of indicator, refer to figure 121, and proceed as follows:
 - (1) Loosen locknut.
 - (2) Use screwdriver to turn adjusting screw. Turn to right to reduce travel

range of the check lever; to left, to increase range. Wear at tip of adjusting screw can also be taken up in this manner.

- (3) When proper adjustment has been made, tighten locknut.
- (4) Be sure hexagon nut is locked against needle bar drive lever.

188. Timing Shuttle

- a. A lockstitch is properly formed for sewing only when the shuttle carrier is timed to bring the shuttle and bobbin thread into the correct position so the needle will pick up the bobbin thread on its upward movement from beneath the needle plate.
- b. The shuttle is timed by an eccentric screw stud connecting the shuttle driving lever and the long rack connecting rod (fig. 127). This stud is reached with a screwdriver



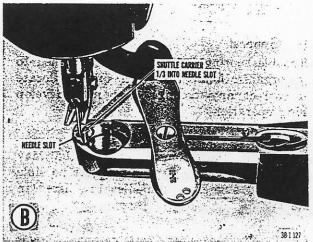


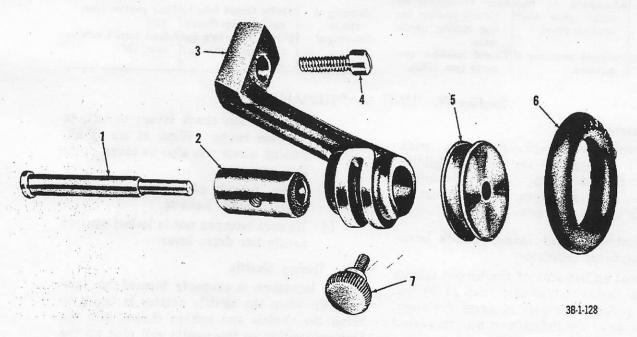
Figure 127. Timing shuttle.

through a hole at the front side of the machine base.

c. Turn eccentric screw stud until leading edge of shuttle carrier moves at each oscillation (forward motion) to a position approximately one-third the distance across the needle slot.

189. Servicing Bobbin Winder

- a. Disassembly. Refer to figure 128, and proceed as follows:
 - (1) Remove frame screw (4) from frame (3), and remove assembly from base of machine.



- Spindle Eccentric Frame
- Frame screw
- 5 Spindle pulley
- Spindle pulley rubber ring Eccentric thumbscrew 6

Figure 128. Bobbin winder, exploded view.

- (2) Remove eccentric thumbscrew (7) from eccentric (2).
- (3) Remove rubber ring (6) from spindle pulley (5).
- (4) Remove spindle pulley from spindle (1).
- (5) Remove spindle from frame.
- (6) Remove eccentric from frame.
- b. Reassembly.
 - (1) Reverse procedure in a above.

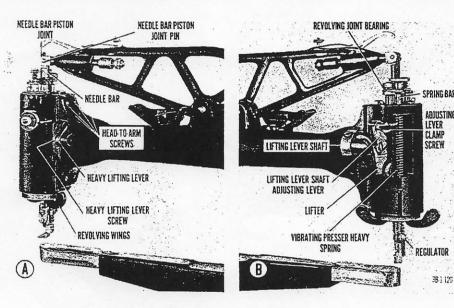
- (2) When attaching frame to base of machine with frame screw, be sure frame is set in slot in base so pulley will separate from balance wheel when thumbscrew is moved upward.
- (3) If pulley maintains any contact with balance wheel after screw has been moved to neutral position, pulley will create heavy drag on operation of machine.

CHAPTER 19

FIELD AND DEPOT MAINTENANCE

190. Patcher Head

- a. Removal.
 - (1) Remove needle bar piston joint pin (A, fig. 129) from needle bar piston joint and needle bar (10, fig. 130).
- (3) Remove arm thread tension stud thumb nut (49), top spring (48), and release cup (47) from adjusting stud (40).
- (4) Remove vibrating presser spring bar



A-Front

B-Rear

· Figure 129. Patcher head.

- (2) Remove 4 head binding screws (53), and release head from arm.
- b. Disassembly.
 - (1) Remove arm thread tension side stud thumb nut (36), side spring (35), and side disks (34) from side adjusting stud (37). Remove stud from patcher head (31).
 - (2) Remove arm thread tension side guide pin (33) and revolving bushing stop thumbscrew (32) from patcher head.

- adjusting nut (52) from spring bar (51).
- (5) Remove feeding foot bar revolving joint upper locknut (13) from slide rod (15).
- (6) Remove feeding foot bar revolving joint hinge pin (50) from bearing (46), and remove bearing from needle bar, arm thread tension top adjusting stud, vibrating presser spring bar, and feeding foot revolving joint slide rod.

- (7) Remove feeding foot revolving joint lower locknut (14) from slide rod.
- (8) Remove arm thread tension top disks (45) and leather washer (44) from adjusting stud, and remove adjusting stud from patcher head.
- (9) Remove thread guide screw (41), head thread guide (38), revolving bushing friction spring screw (19), spring (20), pin (39), revolving bushing supporting washer screws (43), and washer (42) from patcher head.
- (10) Press vibrating presser spring bar down until collar (29) is clear of patcher head, remove screw (28) from collar, remove collar from spring bar, and remove spring bar and heavy spring (18) from patcher head.
- (11) Remove vibrating presser lifting lever shaft adjusting lever clamping screw (17) from shaft (22).
- (12) Remove vibrating presser lifting lever shaft adjusting lever hinge screw (16) from patcher head to release the lever (21).
- (13) Remove feeding foot bar revolving joint slide rod from patcher head.
- (14) Remove vibrating presser lifting lever screw (25) from heavy work lifting lever (26) and arm housing (A, fig. 129), and remove lever.
- (15) Remove vibrating presser lifting lever shaft lever screw (23, fig. 130) from lever (24), remove lever shaft (22), and remove shaft from patcher head.
- (16) Remove vibrating presser lifter hinge screw (30) from patcher head to release the lifter (27).
- (17) Remove feeding foot screw (60) from feeding foot bar (9) to release the feeding foot (59).
- (18) Remove stitch regulator thumbscrew (7) from regulator (8), and slide regulator off feed motion bell crank lever (5) and feeding foot bar to release the stitch regulator gib (6).
- (19) Pull feeding foot bar from revolving bushing (3), revolving bushing handle(4), and feed motion bell crank lever.

- (20) Remove needle bar assembly from head through revolving bushing.
- (21) Remove needle bar thread tension spring screws (54) to release the spring (55).
- (22) Remove needle clamping screw (57) and needle bar needle clamp screw (58) from clamp (56) to release the clamp.
- (23) Remove revolving bushing handle screws (11) from bushing, and slide handle with feed motion bell crank lever from patcher head.
- (24) Remove feed motion bell crank lever screws (12) from revolving bushing handle to release the feed motion bell crank lever.
- (25) Remove feed motion ring slide bar(1) from patcher head, and remove slide bar roll (2) from bar.
- (26) Remove revolving bushing from head.
- c. Reassembly and Installation. Reverse procedures in a and b above.

191. Patcher Bed

The patcher bed (A, fig. 115) houses the shuttle, bobbin, and shuttle drive assembly (par. 161c). The shuttle drive lever, extending up through the machine column with a cam roll fitting into the cam on the drive shaft, is considered a part of the shuttle drive assembly and is included in instructions below. The gearbox (1, fig. 131) may be removed and disassembled as a unit (a(1)(6)) and (a(1)(6)) through (11) below).

a. Removal.

- (1) Detach patching machine from stand by releasing drive belt and removing screws at 4 corners of base holding base to spacer.
- (2) Tip machine to vertical position as shown in figure 131.
- (3) Turn balance wheel until shuttle drive lever connecting rod hinge screw (7) comes into position opposite opening in rear side of bed (fig. 132).
- (4) Insert screwdriver through opening, and remove hinge screw.

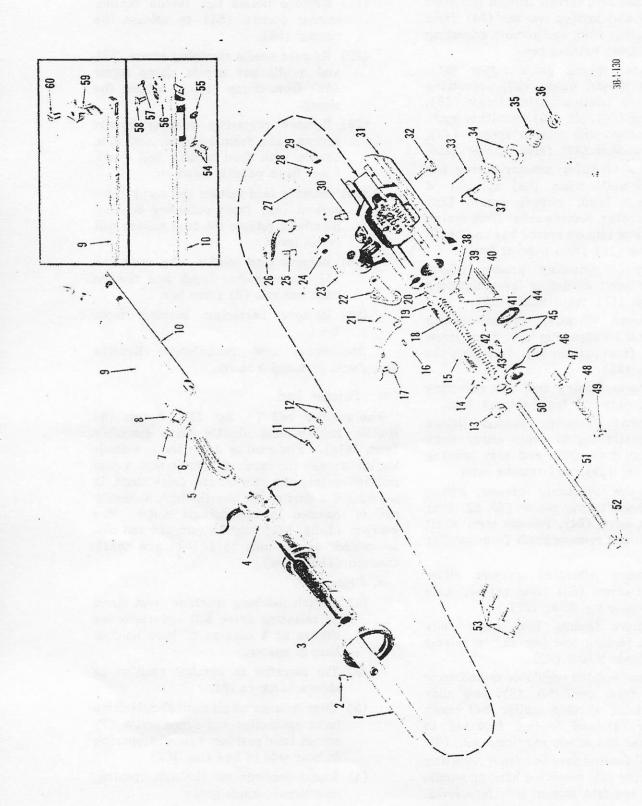


Figure 130. Patcher head, exploded view.

- Feed motion ring slide bar Feed motion ring slide bar roll
 Revolving bushing
 Revolving bushing handle (revolving wings)
 Feed motion bell crank lever Stitch regulator gib Stitch regulator thumbscrew Stitch regulator Feeding foot bar 10 Needle bar assembly Revolving bushing handle screws Feed motion bell crank lever screws Feeding foot bar revolving joint upper locknut Feeding foot bar revolving joint lower locknut Feeding foot bar revolving joint slide rod Vibrating presser lifting lever shaft adjusting lever hinge screw lever clamping screw Vibrating presser heavy spring 19 Revolving bushing friction spring screw
- 17 Vibrating presser lifting lever shaft adjusting 18
- 20 Revolving bushing friction spring 21 Vibrating presser lifting lever shaft adjusting
- lever Vibrating presser lifting lever shaft
- Vibrating presser lifting lever shaft lever screw Vibrating presser lifting lever shaft lever
- Vibrating presser lifting lever screw Vibrating presser heavy work lifting lever Vibrating presser lifter
- Vibrating presser spring bar collar
- Vibrating presser spring bar collar screw '

- Vibrating presser lifter hinge screw
- 31 Patcher head
- 32 Revolving bushing stop thumbscrew 33
- Arm thread tension side guide pin Arm thread tension side disks
- Arm thread tension side spring
- 36 Arm thread tension side stud thumb nut 37 Arm thread tension side adjusting stud
- 38 Head thread guide
- Revolving bushing friction spring pin Arm thread tension top adjusting stud
- Thread guide screw
- Revolving bushing supporting washer Revolving bushing supporting washer screws Arm thread tension top disk leather washer Arm thread tension top disks 42 43
- 45 Feeding foot bar revolving joint bearing
- Arm thread tension release cup Arm thread tension top spring
 Arm thread tension stud thumb nut
 Feeding foot bar revolving joint hinge pin
 Vibrating presser spring bar
 Vibrating presser spring bar adjusting nut 48

- 53 Head binding screws
- Needle bar thread tension spring screws
- 55 Needle bar thread tension spring
- Needle bar clamp Needle clamping screw
- 58 Needle bar needle clamp screw
- Feeding foot
- Feeding foot screw

Figure 130-Continued.

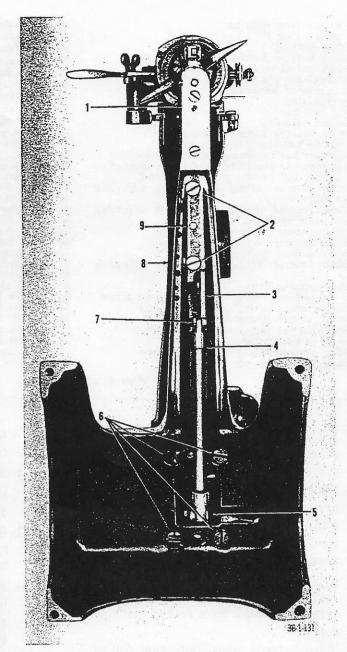
- (5) Remove 2 shuttle drive gearbox screws (2, fig. 131) and positioning pin (9).
- (6) Set machine level and remove shuttle drive gearbox (1) by pulling gearbox away from bed in a horizontal direction. Do not attempt to lift gearbox from housing, as this will crack the long rack (3).
- (7) Remove shuttle drive lever bearing screw (fig. 132) from rear of machine column
- (8) Turn balance wheel until cam roll of shuttle drive lever (fig. 132) is free of shuttle drive cam. Tilt machine back into position shown in figure 131, and pull on lever connecting rod (4) to bring shuttle drive lever down through bottom of column.
- b. Disassembly. Refer to figure 133, and proceed as follows:
 - (1) Remove needle plate screw (1) and needle plate (2) from shuttle drive gearbox (9).
 - (2) Lift shuttle assembly (4) with bobbin

- (3) from gearbox, and remove bobbin from shuttle.
- (3) Remove 2 shuttle pinion cover screws (26) and shuttle pinion cover plate (25).
- (4) Remove needle plate locating plunger spring (21) and plunger (20) from hole in bottom of gearbox.
- (5) Remove shuttle drive short rack (24) by grasping each end of rack with screwdrivers and lifting rack out of gearbox.
- (6) Remove shuttle carrier drive pinion screw (28) from drive pinion (27), and remove drive pinion from end of shuttle carrier (5).
- (7) Push shuttle carrier out through top of gearbox.
- (8) Tap shuttle carrier drive pinion bushing (22) from gearbox.
- (9) Tap tapered shuttle carrier following pinion stud (6) out through top of gearbox, and remove following pinion (23) from gearbox.

- (10) Remove shuttle drive long rack (16) from gearbox.
- (11) Tap needle plate releasing lever hinge pin (7) out of side of gearbox, and remove needle plate releasing lever (8) from gearbox.
- (12) Remove shuttle drive lever eccentric stud nut (13), and pull stud (10) from connecting rod (14) and shuttle drive lever (11).

c. Reassembly.

- (1) Place shuttle drive lever eccentric stud (10, fig. 133) through holes in connecting rod (14) and shuttle drive lever (11), and install stud nut (13) on stud.
- (2) Connect needle plate releasing lever (8) to shuttle drive gearbox (9) with hinge pin (7).
- (3) Tap shuttle carrier drive pinion bushing (22) into opening in gearbox.
- (4) Tap small end of tapered shuttle carrier following pinion stud (6) into hole on top of gearbox until large end of stud is flush with top of gearbox.
- (5) Fit shuttle carrier (5) through opening of bushing in gearbox, and install on end of carrier the drive pinion (8, fig. 134) with teeth in position shown.
- (6) Install shuttle carrier drive pinion screw (28, fig. 133) into carrier drive pinion.
- (7) Slip shuttle drive long rack (3, fig. 134) into position in raceway in gearbox with first tooth of rack meshing with shuttle carrier drive pinion.
- (8) Slip shuttle drive short rack (7) into position in raceway so first tooth of rack meshes with carrier pinion.
- (9) Fit shuttle carrier following pinion (6) on end of shuttle carrier following pinion stud.
- (10) Slide needle plate locating plunger (20, fig. 133) and spring (21) into hole in gearbox.
- (11) Place shuttle pinion cover plate (2,



Shuttle drive gearbox

Shuttle drive gearbox screws Shuttle drive long rack

Shuttle drive lever connecting rod Shuttle drive lever eccentric stud

Patcher arm-to-base screws

Shuttle drive lever connecting rod hinge screw

Patcher bed housing

Shuttle drive gearbox positioning pin

Figure. 131. Patcher bed positioned for removal of gearbox and shuttle drive lever (front at right; rear at left).

fig. 134) on gearbox with round end of cover plate at open end of gearbox, press down on plate to hold it against pressure of needle plate locating plunger spring (5), and install shuttle pinion cover screws (1).

- (12) Slide bobbin (3, fig. 133) into shuttle (4), and fit shuttle in shuttle carrier in gearbox.
- (13) Place needle plate (2) on top of gearbox, and install needle plate screw (1).

d. Installation. Reverse procedure in a above.

192. Patcher Arm

- a. Disassembly.
 - (1) Remove patcher head (par. 190a).
 - (2) Disassemble patcher arm (fig. 135) as it is removed from machine.
 - (3) Remove drive belt (fig. 135) by working belt off drive pulley.
 - (4) Remove balance wheel handle spindle nut (31, fig. 136), spindle (29), and handle (30) from balance wheel (25).
 - (5) Remove balance wheel stop motion plunger thumb nut (28) from plunger (23).
 - (6) Remove balance wheel retaining screw

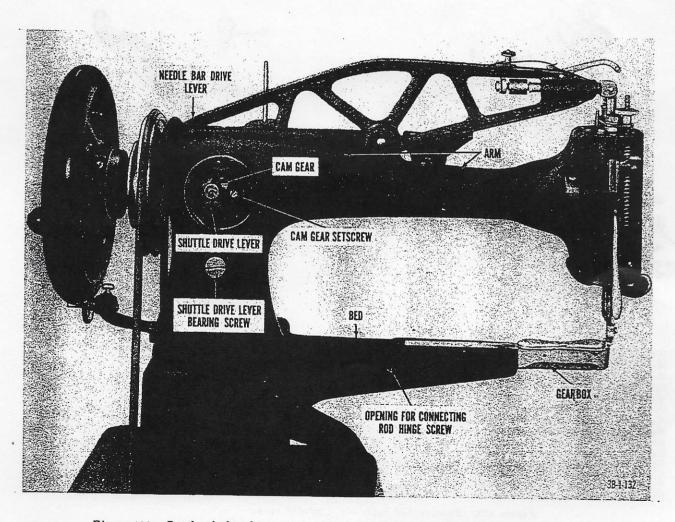
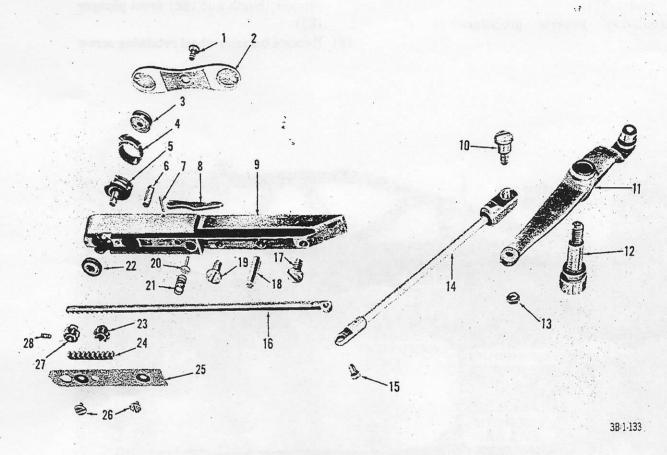


Figure 132. Patcher bed and arm, rear view, with shuttle drive lever and cam exposed.

- (27) from stop motion flanged bushing (22).
- (7) Remove balance wheel from stop motion flanged bushing with plunger spring (24) and plunger.
- (8) Remove balance wheel stop motion plunger stop screw (26) from balance wheel, and remove stop motion plunger and spring from wheel.
- (9) Unscrew balance wheel stop motion flanged bushing binding screws (32)

- from flanged bushing, and slide bushing from drive shaft (34).
- (10) Remove drive pulley pin (21) from drive pulley (20), drop belt off end of drive shaft, and slide pulley from shaft.
- (11) Remove needle bar drive lever pin (35) from needle bar drive lever (36), and remove drive lever from arm.
- (12) Remove check lever indicator ad-



3 4 5 6 7 8 9 10 11		16 17 18 19 20 21 22 23 24 25	Shuttle drive lever connecting rod hinge screen Shuttle drive long rack Shuttle drive gearcase screw Shuttle drive gearbox positioning pin Shuttle drive gearcase screw Needle plate locating plunger Needle plate locating plunger spring Shuttle carrier drive pinion bushing Shuttle carrier following pinion Shuttle drive short rack Shuttle pinion cover plate Shuttle pinion cover grays
	Shuttle drive lever bearing screw		Shuttle pinion cover screws
	Shuttle drive lever eccentric stud nut		Shuttle carrier drive pinion
14	Shuttle drive lever connecting rod	28	Shuttle carrier drive pinion screw

Figure 133. Patcher bed assembly, exploded view.

justing screw locknut (17) from adjusting screw (16), and remove adjusting screw from indicator head (12).

- (13) Remove check lever indicator (15) from adjusting screw.
- (14) Remove check lever indicator locating plunger (14) and spring (13) from indicator head.
- tension spring stud nut (8) from stud (9), and unscrew stud to release tension spring (7).
- (18) Remove vibrating presser lifting lever screw (25, fig. 130) from heavy work lifting lever (26), and remove lever.
- (19) Remove rear side cover thumbscrew (39, fig. 136) and rear side cover (40).

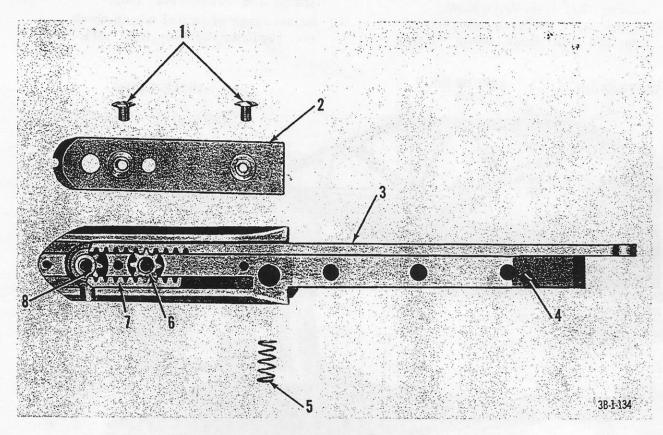


Figure 134. Shuttle drive gearbox assembled.

- 1 Shuttle pinion cover screws
- 2 Shuttle pinion cover plate
- 3 Shuttle drive long rack 4 Shuttle drive gearbox
- 5 Needle plate locating plunger spring
- 6 Shuttle carrier following pinion
- 7 Shuttle drive short rack
- 8 Shuttle carrier drive pinion

- (15) Remove check lever indicator head and hexagon nut (11) from needle bar piston joint (4), and remove nut from head.
- (16) Remove thread takeup check lever hinge pin (6), check lever (5), and needle bar piston joint from needle bar drive lever.
- (17) Remove thread takeup check lever
- (20) Remove shuttle drive lever bearing screw (fig. 132). Turn drive shaft enough to release shuttle drive lever from shuttle drive lever cam. If necessary, tip machine on end (fig. 131) enough to pull connecting rod (4) and make sure lever is free of cam.
- (21) Hold feed motion cam wheel (1, fig.

- 136), turn drive shaft until lever cam setscrew (18) shows in opening, and remove screw.
- (22) Turn drive shaft again until shuttle drive cam pin (19) shows in arm opening for needle bar drive lever (fig. 132). Drive pin from arm so pin drops from base.
- (23) Remove feed motion cam wheel pin (2, fig. 136) from cam wheel, and slide cam wheel and drive shaft bushing (37) from drive shaft.
- (24) Grasp drive shaft at head end of arm and pull shaft slowly. Keep

- other hand on shuttle drive cam with gear (33) until it slides off balance wheel end of shaft in housing. Remove cam with gear through rear side opening.
- b. Reassembly. Reverse procedure in a above.
 - c. Adjustment.
 - (1) Thread machine (par. 175d).
 - (2) Adjust thread takeup check lever tension and stroke (par. 173).
 - (3) Adjust range of thread takeup check lever regulator indicator (par. 187).

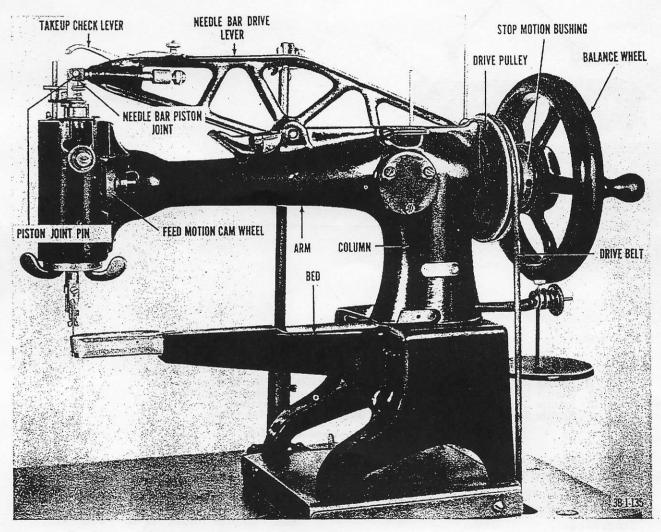
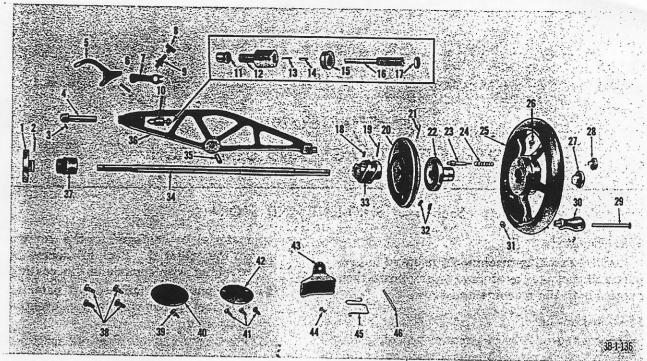


Figure 135. Patcher arm, front view.



Feed motion cam wheel Feed motion cam wheel pin Needle bar piston joint pin Needle bar piston joint Balance wheel Balance wheel stop motion plunger stop screw 27 Balance wheel retaining screw Thread takeup check lever Thread takeup check lever hinge pin Balance wheel stop motion plunger thumb nut Balance wheel handle spindle 29 Thread takeup check lever tension spring
Thread takeup check lever tension spring stud nut
Thread takeup check lever tension spring stud nut
Thread takeup check lever tension spring stud
Thread takeup check lever indicator and regulator
Check lever indicator head hexagon nut
Check lever indicator head Balance wheel handle 30 Balance wheel handle spindle nut 31 Balance wheel stop motion flanged bushing binding screws 33 Shuttle drive cam with gear 12 13 14 15 Drive shaft Check lever indicator locating plunger spring Check lever indicator locating plunger 35 36 37 38 Needle bar drive lever pin Needle bar drive lever Check lever indicator Drive shaft bushing Check lever indicator adjusting screw Check lever indicator adjusting screw locknut Patcher arm-to-base screws Rear side cover thumbscrew Rear side cover Front side cover screws Front side cover 39 Shuttle drive cam setscrew Shuttle drive cam pin Drive pulley
Drive pulley pin
Balance wheel stop motion flanged bushing
Balance wheel stop motion plunger
Balance wheel stop motion plunger 20 21 22 23 Drive lever oilcup Drive lever oilcup screw Drive lever oilcup spring 45 Balance wheel stop motion plunger spring 46 Thread spool pin

Figure 136. Patcher arm, exploded view.